A COMPARATIVE STUDY OF THE RELATIVE GROWTH IN READING VOCABULARY AMONG FORTY SECOND-GRADE CHILDREN IN EMMETT SCOTT SCHOOL -ROCK HILL, SOUTH CAROLINA

A THESIS

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BY

BESSIE ESTELLE HONOR

SCHOOL OF EDUCATION

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CHAPTER I

INTRODUCTION

Statement of the Problem.--To compare the relative growth in reading vocabulary among forty second-grade children, divided into two groups, using the methods of free reading and restricted reading in Emmett Scott School, Rock Hill, South Carolina.

Purpose of the Study.--To determine the better of two methods of teaching reading to second grade children.

The Children.--Forty second-grade pupils of Emmett Scott School, Rock Hill, South Carolina, are included in this experiment.

Period of Study.--The experiment was carried on for eighteen weeks beginning January 1945 and ending May 1945. Thirty minutes were used daily for recitations.

The Tests Used.--The following tests were used in the study: The Pintner-Cunningham Primary Test, Form B, The Detroit Word Recognition Test, Form B, The Detroit Word Recognition Test, Form C, and The Detroit Word Recognition Test, Form D.

Definitions.--"Free reading" is an informal method of teaching reading based on the principle that one learns to read by reading.

"Restricted reading" is a formal method of teaching reading in which pupils are given specific assigned stories from basic textbooks and charts.

"Vocabulary," as referred to in this study deals specifically with word recognition (reading vocabulary).

Related Literature.--The writer found several studies made in the field

of vocabulary growth or development. Some have been made in limited portions of the field such as the determination of words necessary in the mastery of content. Some have studied mastery alone, while others have tried to discover the amount of retention as well. Some of the earlier studies were made in connection with building vocabulary tests, others with the purpose of building word tests appropriate to definite groups such as grades, subjects, and so forth, and others, for the discovery of the actual working vocabularies of such groups.

Paul McKee, Professor of Elementary Education and Director of College Elementary School, State College of Education, Greely, Colorado, in his report on "Vocabulary Development" states:

> If a child or an adult is to achieve fundamental value through various reading activities proposed in this report great importance must be attached to the development of an adequate vocabulary.
>
> A "reading vocabulary" consists of the word phrases, and printed symbols that can be utilized by the reader in securing meaning. The school's responsibility in building such a vocabulary involves two major instructional tasks. First, opportunities must be provided through which the child builds concepts, understandings, or meanings, and becomes efficient in using this spoken symbol of these concepts. The first task is commonly known as the development of the rich meaning vocabulary. Second, training must be given to equip the child with the ability to identify the words, phrases and other printed symbols that are used to represent these concepts or meanings in reading matter. The second task is commonly known as training in word recognition.[1]

In Burgess' Dissertation at Columbia University it is said, that reading is the most important single subject the child has to learn. Poor results of schooling are attributed to methods which fall short of being fully effective. Thus, to be an efficient reader one must develop a good vocabulary.

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[1] Paul McKee, "Vocabulary Development," Thirty-Sixth Year Book, Part I, National Society For The Study of Education (Bloomington, Illinois, 1937), pp. 277-302.

She further states, that the teaching of reading could be rendered more effective if good measuring instruments were available to show which teaching methods produce the best results; what influences are operative in preventing children from becoming readers; and how these influences may be overcome.[1]

The Harlan method for enlarging vocabulary is a good representative. He attempted to measure the growth of vocabulary in first semester psychology students. He had each student to make a glossary of technical terms, especially those which caused him difficulty. In this way he secured four hundred terms. One hundred and seventy-six of which he regarded as being sufficient frequency to be counted as essential to the mastery of psychology. A test was given before taking an eighteen-week course in beginning psychology and again after taking the course. The results showed those who had the smallest vocabulary in the beginning made the greatest gain.[2]

Eurich tested out a method of enlarging vocabularies at the University of Minnesota. He divided the freshman English classes into experimental and control groups. Both groups were given a series of English Vocabulary and intelligence tests. In his study he concluded,

> That students enlarge their vocabularies through special attention directed to that end, and that it is better to work with specific drills than to attempt to aspire to vocabulary growth by general and indirect means.[3]

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[1] May Ayres Burgess, "The Measurement of Silent Reading," Unpublished Doctor's Dissertation, Department of Education, Columbia University, 1921, pp. 16-17.

[2] C. L. Harlan, "The Technical Vocabulary of Psychology," Journal of Educational Psychology, XVII (1926), pp. 534-537.

[3] Alvin C. Eurich, "Enlarging Vocabularies," Journal of Higher Education, III (1932), pp. 315-317.

Johns made an experiment at the University of Nebraska on "Vocabulary Growth" among University students with some consideration of the same.

> He attempted to discover whether a procedure can be set up in a University class administered in a way that will secure an amount of vocabulary learning beyond that which normally ensues when no special attention is given to the matter incidentally to measure the growth and word mastery under usual conditions. He concludes that in general it appears that college students do learn measurable amounts of words peculiar to their subjects and also that they grow in general vocabulary, but this learning is appreciably increased under a program of directed effort to obtain such learning.[1]

An experiment in vocabulary building was made by Harold W. Bernard at the University of Oregon.

> The testing program extended over a period of six-academic quarters showed that there was a higher correlation between vocabulary score and grade point average than was the correlation between reading and grade point average. These findings introduced the problem of vocabulary as an aspect of scholarship improvement.
>
> In the attempt to discover whether vocabulary improvement is amenable to specific instruction, drill project was established to determine the extent to which the vocabulary score could be raised in a specified unit of time. Students in two sections of a lower-division class in "Mental Hygiene" were used as subjects. Sixty students were in each of the two sections. The Inglis Test of English Vocabulary Form "A" was used as the basis for the divisions of sections into experimental and control groups.
>
> The following conclusions were drawn from the study:
>
> 1. A student's vocabulary grows as he attends school regardless of whether or not he gives the matter much specific attention.
> 2. There is a measurable gain in vocabulary in as short a period as six weeks.
> 3. Students who give vocabulary specific attention may gain about twice as rapidly as those whose vocabulary is incidental.[2]

At Pennsylvania State College an experimental study was made by Ralph W. House on two hundred twenty-two fourth grade pupils.

This experiment attempted to show the effect of a program of

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[1] Walter B. Johns, "Vocabulary of University Students," Journal of Experimental Education, VIII (1939), pp. 89-101.

[2] Harold W. Bernard, "An Experiment in Vocabulary Building," School and Society, LIII (1941), pp. 742-743.

initial instruction on the pronunciation scales at the fourth grade level as evidence in skill growth.

The evaluation of the data was summarized in these words, "The ease and success with which fourth grade pupils can use a complete symbolization as a phonetic aid in analyzing new words seemed in this experiment to depend largely upon this method of instruction, the materials of instruction and the complete symbolization employed."[1]

George C. Kyte made a study of "A Core Vocabulary for the Primary Grades." He states,

> The most exhaustive research studies considered in relation to one another and to similar contributing studies yield a core of common words, which, when mastered form the usable framework for further vocabulary building.
>
> During the past two decades especially fundamental studies of various phases of word usage have been made. Numerous supplementary studies are needed to add essential information even with regards to commonly used words, it is possible to compile valuable core vocabularies.
>
> The core vocabulary should prove of value in planning children's writing difficulties and additional need for mastery of certain words, letters and combinations of letters.[2]

A study of new words appearing in first, second, and third readers was made by Stone in order to obtain a vocabulary to form the basis for a series of work books in phonics.

> A list of 1,276 words were found. This list is of value when writing reading material supplementary to second readers and when designing work books, seatwork and practice exercises to supplement second readers.
>
> The list has a value as a standard by which to judge the vocabulary of second readers which are under consideration for basal or supplementary use.[3]

At the opening of the second semester in 1929-30, Bergman and Vreeland studied two reading methods, the visual method and picture story method, in

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[1]Ralph W. House, "The Effect of a Program of Initial Instruction on the Pronunciation Skills at the Fourth Grade Level as Evidence in Skills Growth," Journal of Experimental Education, X (1941), pp. 54-55.

[2]George C. Kyte, "A Core Vocabulary for the Primary Grades," Elementary School Journal, XLIV (1943), pp. 157-164.

[3]Clarence R. Stone, "The Second Grade Reading Vocabulary," Elementary School Journal, XXXV (1935), pp. 359-367.

sohools of Detroit.

> Only three of these schools were seleoted for inclusion in the study. These three sohools were matohed with three others in which the visual and pioture story method were used. During the seoond, eighth, thirteenth, eighteenth week of school a series of tests were given to six classes included in the experiment. The Detroit Reading Test was used.
>
> This study showed no relative effeotiveness of the two methods in obtained objective other than growth in achievement in word reoognition.[1]

Hildreth gave an exoellent report on "All in Favor of a Low Vocabulary."

> When vocabulary load is too heavy in the primary grades the emphasis seemed to be placed on phonics and other word analysis teohniques rather than for the aid they can give in rapid reading.
>
> Teachers everywhere testify that the new low vooabulary, combined with other advanced features of primary grade reading material takes the pain out of beginning reading.
>
> A low vocabulary load if it carries child like content lays the best foundation for continuous reading growth in intermediate grades.[2]

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[1] W. G. Bergman and Wendell Vreeland, "Comparative Achievement in Word Recognition Under Two Methods of Teaching Beginning Reading," Elementary Sohool Journal, XXXII (1932), pp. 605-616.

[2] Gertrude Hildreth, "All in Favor of a Low Vooabulary," Elementary Sohool Journal, XLIII (1943), pp. 462-470.

CHAPTER II

PROCEDURE

In January 1945 the investigator initiated the experiment with the children to determine the better method of teaching reading for vocabulary development.

The outline of the plan, Figure 1, Page 8, shows the set up of the operating procedure. The General Ability Pintner-Cunningham Primary Test, Form B was given forty children of the second grade. The I. Q. for each subject was derived by the customary ratio method. I. Q.'s were arranged in sequence order, the highest to the lowest and the odds and evens were matched forming two groups. See Table 1, page 33.

The Detroit Word Recognition Test, Form B, the initial test, was given the children. The obtained scores were arranged according to the paired I. Q. grouping as shown in Table 1, page 33.

New words selected by the pupils and by the investigator were taught by the following methods:

1. Picture Clues
2. Context Clues
3. Ear Training
4. Initial Consonants and Initial Consonant Blends
5. Similarities and Differences in Word Forms
6. Word Building
7. Basic Words in Derived Forms
8. Little Words in Big Words
9. Rhyming Words
10. Compound Hyphenated Words

FIGURE 1

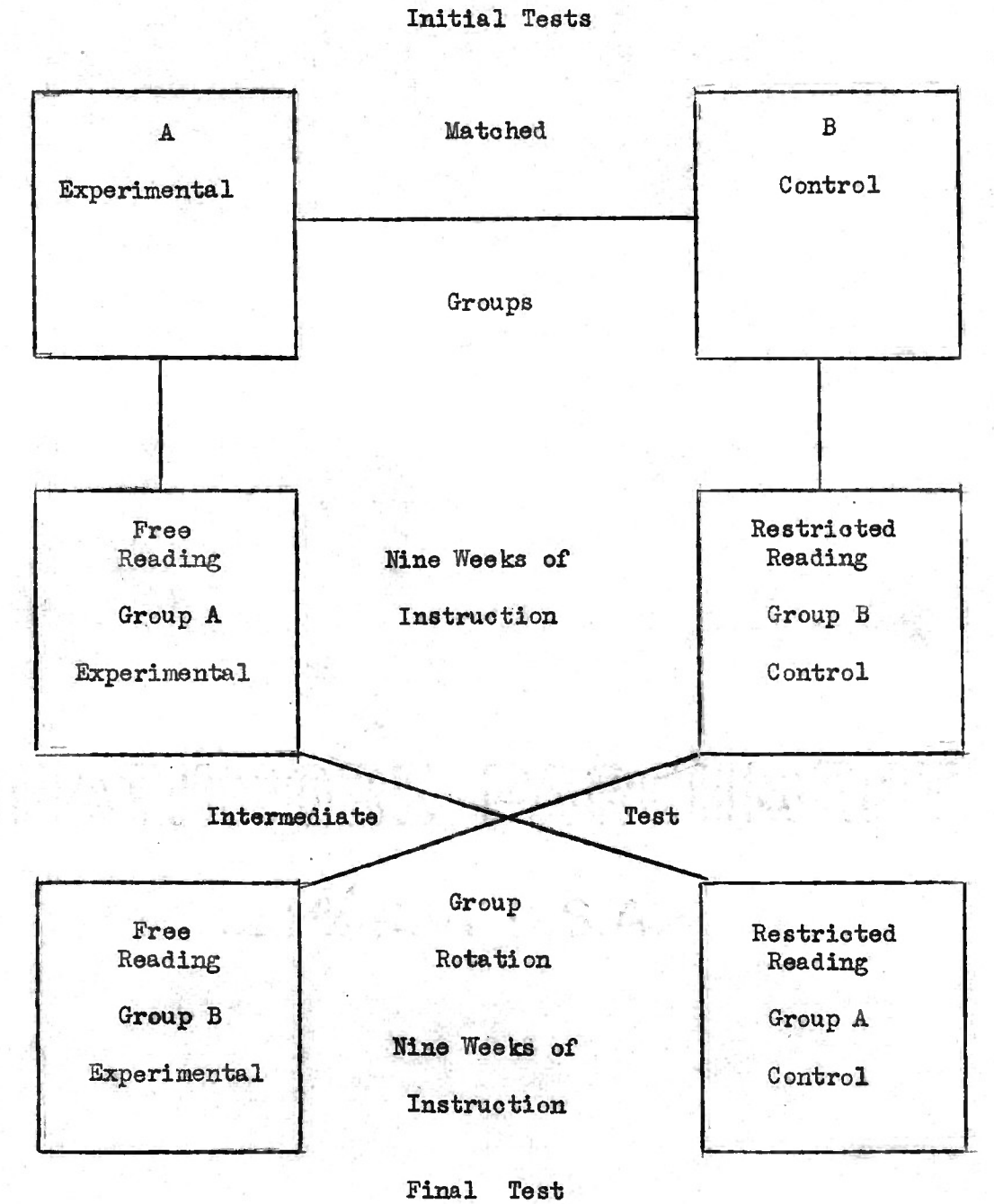

Fig. 1.- Diagram Showing the Cross-checking Method in the Reading Experiment.

11. Phonetic Parts

12. Vowels

13. Auditory and Visual Analysis

14. Left to Right Scanning

15. General Word Configuration.

See pages 18-21 for samples of each method taught.

Group A, the experimental group, or free readers, read from the library in the classroom which consisted of a variety of primary books, magazines, and newspapers. On pages 41 and 42 in the Appendix are listed the reading materials used by this group. New words found by the children in stories read were written on a slip of paper and given the experimenter. An alphabetical list of new words selected by these pupils is found on pages 11 and 14. An approach to these new words was made by either of the various methods listed in the study. Each child kept word lists of new words found and used them for further study. The investigator made individual contacts frequently with children to see if new words had become sight words. Exercises and games for vocabulary development as shown on pages 22-24 were often given pupils to help them learn new words. Twice a week the subjects read stories to each other. Each child tried very hard to learn new words and to make them become sight words in order to read well to other members of the group.

Group B, the control or restricted readers were given specific assigned stories from basic text-books, charts, and original hectograph stories which centered around some of the important dates or recent happenings. See page 43 of the Appendix. A selection of new words was made by the experimenter from the teacher's manual and glossary. See pages 15-17. An attack on new words was made by the same methods as described by the writer. Frequent

checks were made on pupils to see if new words had become sight words. Exercises and games for vocabulary development were given often to help pupils master new words. Pupils read orally the assigned stories. Many questions were asked the children about the story read. Often pupils conversed and discussed the story guided by the teacher. Frequently, the story was dramatized, or the story was told by one member of the group.

The intermediate test, the Detroit Word Recognition Test, Form C was given both groups at the end of the nine-week period. Groups were rotated. See Figure 1, page 8. Group A, the experimental or free readers became Group A, control or restricted readers. Group B, the control,or restricted readers, became Group B, experimental, or free readers. The same teaching method as indicated in each group was carried on for nine weeks.

All the children included in the experiment were given the final test, The Detroit Word Recognition Test, Form D at the end of the eighteen week period. This closed the experiment.

WORDS SELECTED BY PUPILS IN THE EXPERIMENTAL GROUP

about	aunt	broom	corner
across	automobile	brown	cotton
add	awake	buttercup	count
afraid	around	butterfly	country
afternoon	baby	cabbage	cousin
afterward	balloon	carrot	company
again	banana	caught	day
against	bang	chalk	dear
airplane	bank	chick	dinner
alone	bark	chicken	dirty
along	barnyard	children	doctor
already	basket	Christmas	does
America	beautiful	circus	donkey
among	became	clang	drink
angry	because	clean	duck
animal	become	climb	east
another	bigger	clothes	each
answer	biggest	cloud	eight
anyone	bird	clown	elephant
anything	birdie	cluck	enough
apple	birthday	cocoa	evening
apron	blackboard	coffee	everyone
asleep	breakfast	coming	fairy

WORDS SELECTED BY PUPILS IN THE EXPERIMENTAL GROUP (continued)

fat	gather	house	left
fear	geese	home	lesson
February	God	hundred	listen
feed	gold	however	little
field	gone	ice-cream	look
fish	going	Indian	lost
flew	goodby	inside	loud
flies	goody	iron	love
floor	goose	jar	lunch
flour	grandma	jump	make
flower	gray	just	made
fly	gruff	June	mail
food	hair	kettle	March
fool	handkerchief	king	market
forest	happy	kiss	May
free	health	kitten	meadow
frighten	hello	knock	meat
frog	herself	lady	merry
frost	himself	lamp	might
fruit	hill	last	mile
game	honey	lazy	minute
garage	horse	leaf	month
garden	hour	learn	mother

WORDS SELECTED BY PUPILS IN THE EXPERIMENTAL GROUP (continued)

mouth	quick	smell	think
music	queen	snow	time
neighbor	quiet	soap	today
nickel	rabbit	spider	tomorrow
north	radio	splash	tortoise
nose	rainy	spoon	turkey
o'clock	reach	squeaky	turtle
once	reindeer	squirrel	turnip
open	remember	stable	tulip
orange	ribbon	stamp	ugly
page	river	station	unhappy
palace	robin	stocking	upstairs
papoose	rooster	storekeeper	Valentine
party	safety	Sunday	violet
peanut	school	supper	visit
pencil	scrub	surprise	wagon
place	second	sweet	watch
playhouse	shine	table	week
policeman	softly	teacher	Wednesday
present	soldier	teeth	wheat
postman	something	telephone	wheel
puppy	sometime	their	where
quack	sound	there	walk

WORDS SELECTED BY PUPILS IN THE EXPERIMENTAL GROUP (continued)

wash	wigwam	woodpecker	wrong
wait	win	word	yard
what	without	work	yellow
white	window	write	young
whom	wolf	would	your
wide	won't	wore	yourself

TOTAL - 300 WORDS

WORDS SELECTED FROM TEACHER'S MANUAL AND GLOSSARY BY THE TEACHER FOR THE CONTROL GROUP

pleasant	Saturday	money	people
balloon	fall	pay	painted
telephone	zeke	letter	funny
use	building	got	cold
heard	clothes	candy	window
I'll	game	jolly	wonderful
uncle	ten	both	shovel
Joe	call	pile	much
Ann	brown	burn	himself
John	pull	fire	circus
city	line	bricks	lights
didn't	that	potatoes	beautiful
handkerchief	park	told	plant
sister	stay	biggest	church
tie	train	wouldn't	drum
today	bell	second	o'clock
buzz	would	Miss	thought
across	tell	always	parade
ting-a-ling	more	nice	near
eyes	full	sorry	watch
neighbors	around	keep	breakfast
drops	hand	care	brought

WORDS SELECTED FROM TEACHER'S MANUAL AND GLOSSARY BY THE TEACHER FOR THE CONTROL GROUP (continued)

spring	sun	stout	enough
afraid	woods	gave	grass
hurried	better	first	hole
through	Bobby	honk	guess
stick	catch	sang	field
I'm	hungry	give	leaves
blow	behind	show	robin
Johnny	yesterday	elephant	barn
shook	snow	crow	school
move	friend	flew	chimney
scare	wish	fence	happy
mouse	house	winter	brother
seeds	don't	cookie	wiggled
answered	front	large	galloping
slow	family	tried	rooster
turn	sign	garden	father
build	time	visit	sting
ground-hog	water	ride	morning
night	fine	trick	to-morrow
noise	goat	calf	clean
minute	strings	short	early
listen	basket	side	umbrella

WORDS SELECTED FROM TEACHER'S MANUAL AND GLOSSARY BY THE TEACHER FOR THE CONTROL GROUP (continued)

upstairs	speak	Easter	curtain
Valentine	mitten	fairy	joke
trousers	lesson	plow	garage
good-day	milkman	orange	Tuesday
wore	music	parade	Friday

TOTAL - 196 WORDS

Methods of Teaching Word Recognition.--The investigator used many methods with words to have pupils make new words become sight words. Below are the names of the methods used in teaching word recognition and a sample of each method taught.

1. Picture Clues:

   A picture of a merry-go-round. Children riding on the merry-go-round. A recognition of the word circus in the sentence, "The children went to the circus.

2. Context Clues:

   Grandfather was riding in his car.

   All at once it stopped.

   Do you know why?

   There was no gas in the car.

   Picture clues may suggest the word car.

   Only context clues can suggest the word gas.

3. Ear Training:

   Teacher: I know a word which begins like bring.

   Child: Is it brown, etc?

   Teacher: I know a word which begins like ring.

   Child: Is it sing, etc?

   Teacher: Two of these words rhyme. One does not rhyme. Which of these words rhyme?

   big buy pig

4. Initial Consonant and Initial Consonant Blends

   Some initial consonants are b, f, h, l, m, s, t, g, p, d, w, c, k, j, r, n, etc.

Initial consonant plus a picture clue.

There were _____ in that big basket.

(I see a bottle of milk and some cakes in the picture. This new word must be cake. It can't be milk because it begins like came.)

Initial consonant plus a context clue.

Mother looked out of the d_____.

(Mother could look out of a window but this new word isn't window. It begins like doll.)

Consonant blends were taught in the same manner.

bl - black	gr - grass	fl - fly
br - bring	str- straw	tr - train
cr - cry	sw - swim	gl - glass
cl - clock	sl - slow	pl - play
sm - smile	fr - from	pr - proud

5. Similarities and Differences in Word Forms:

where - there	when - then	money - many
house - home	book - look	saw - was

6. Word Building:

some	thing	----------	something
barn	yard	----------	barnyard
dis	cover	----------	discover
him	self	----------	himself
black	board	----------	blackboard

7. Basic Words in Derived Form:

stop	stops	stopping	stopped
walk	walks	walking	walked

Basic Words in Derived Form (continued)

play	plays	playing	played
ory	ories	orying	oried

Teaoher: There is a long word in the next sentence but it is easy. You can get it. There is a little word that you know right at the beginning of the big word. Can you see it?

8. Little Words and Big Words:

ate - gate	ear - hear	lay - play
rain - train	ink - think	hoe - shoe

9. Rhyming Words:

sang - rang	oat - rat	light - bright
cold - told	gay - day	black - quack
book - look	big - pig	house - mouse

10. Compound - hyphenated Words:

good - by	ice - cream	middle - sized
rock - a - by	door - step	wood - cutter

11. Phonetic Parts:

The sound of,

a - all	br - bring	ol - close
e - come	ar - car	gr - grass
y - any	et - get	pl - please

12. Vowels:

a, e, i, o, u

If there are two vowels in one syllable words the first vowel generally has its long sound and the second one is silent. If there is but one vowel it generally has a short sound.

Vowels (continued)

make	come	sit
take	hand	stop

Teacher: How does this new word begin?

plain

Yes, like play.

How many vowels do you see?

What will the first one say?

How about the second?

Now you can get it.

Yes, the new word is plain.

13. Auditory and Visual Analysis:

In Auditory Analysis the sound of the word is heard. The sound of "l" is heard as the way the word little begins, not as an isolated sound. Pupils hear sounds, vocalize sounds in word wholes and connect letter symbols with them. In Visual Analysis the pupils are encouraged to see the word, think the sounds, but not vocalize them.

14. Left to Right Scanning:

Pupils begin always with initial consonant or consonant combination and scan complete word from left to right analyzing as they go. This gives them a correct mental picture of the word and guards against reversal. (g-a-t-e - gate) (b-l-u-e - blue)

15. General Word Configuration:

Recognition of Words at Sight Through General Appearance

through	general	appearance
laugh	enough	clock

Exercises and Games Used for Vocabulary Development.--For checks on subjects the experimenter listed a sample of each kind used in developing vocabulary growth.

1. Choosing the Right Word

Draw a line under the right answer

When flowers are in bloom, honey bees are

big. busy. brown.

The honey made by bees can be used for

food. farms. flowers.

A bee's house is called a

hen. hole. hive.

2. A Matching Game

Opposite each number write the letter of the phrase showing where each animal, bird, or insect makes its home.

1. cow _____	a. in a pen
2. pig _____	b. in a hole in a tree
3. bee _____	c. in the forest
4. rabbit _____	d. in a barn
5. squirrel _____	e. in a hive

3. Name Opposites

Tell the word that is opposite in meaning

buy	(sell)	poor	(rich)
high	(low)	stop	(go)
good	(bad)	work	(play)
fast	(slow)	long	(short)
country	(city)	day	(night)
give	(take)	winter	(summer)

3(a). Name Opposites

Draw a line to the word opposite in meaning.

quick	hot
glad	fall
cold	sorry
city	sleep
spring	slow
wake	country

4. Building Associations Around Words

Give other words that the underlined words make you think of.

<u>cows</u>	<u>bees</u>	<u>garden</u>	<u>chickens</u>
barn	honey	seeds	hen
milk	oakes	food	rooster
grass	hives	planting	eggs
meat	blossoms	lettuce	nest
farmer	candy	vegetables	chicken-house

4(a). The above list was often left on the blackboard and phonetic games were played with pupils who needed guidance in word attack.

How many words do you find that begin the way baby begins?

How many words do you find that begin the way can begins?

How many words do you find that begin the way mother begins?

Find a word that rhymes with best.

Find a word that rhymes with money.

Find two words that end the way flower ends.

Draw a circle around the word that begins like green.

5. Add a Word

Give a word that belongs with each group of words.

Add a Word (continued)

west	north	south	_____
pig	sheep	horses	_____
spring	winter	summer	_____
green	brown	red	_____
school	store	church	_____

6. Riddles

I have a roof.

I have windows.

Children stay in me.

I am a _____.

I am white.

I come from the cow.

People drink me.

I am _____.

I live in a nest.

I am little.

I can fly and sing.

I am a _____.

A Descriptive Analysis of Subjects.--The following will give the analysis of each pupil as observed by the investigator in the two groups.

Group A

Case 1. Cyphese, Age 7 Yrs. I. Q. 123
Begins work readily when signal is given.
Wastes no time in selecting material to read.
Talks with pleasure about passages read.
Recognizes new words easily and with speed.
Reads silently with only a few lip movements.
Gives distinct pronunciation of words.
Shows excessive elocutionary effect in oral reading.

Case 2. John, Age 6 Yrs. I. Q. 104
Slow about getting ready to work.
Reads slowly but not haltingly.
Occasionally ignores punctuation marks.
Shows some inability to form judgment on material read.
Comprehends simple stories readily.
Interested more in picture reading.
Difficulties shown in accent and choices of phonic sound.

Case 3. Mary, Age 7 Yrs. I. Q. 100
Begins work immediately at the given time.
Shows evidence of interest in books.
Reads silently and orally with ease.
Recognizes readily most of the sight words.
Reads well to audience.
Discusses freely story read.
Grasps work quickly.

Case 4. Amanda, Age 7 Yrs. 11 Mos. I. Q. 100
Wastes no time in getting to work.
Enjoys reading stories both orally and silently.
Discusses freely material read.
Shows interest in reading.
Reads aloud clearly in thought units.
Recognizes new words readily.
Becomes restless in silent reading frequently.

Case 5. W. T., Age 8 Yrs. I. Q. 92
Starts work promptly.
Reads silently with few or no lip movements.
Understands story read.
Discusses intelligently material read.
Reads orally with ease.
Recognizes most of the sight words.
Grasps new words quickly.

Case 6. Marvin, Age 7 Yrs. 5 Mos. I. Q. 91
Moves swiftly when time to read.
Handles books with care.
Prefers to read from story books.
Understands and enjoys stories read.
Asks questions about and discusses intelligently the contents of what is read.
Shows difficulty with longer words.

Case 7. Audry, Age 7 Yrs. 9 Mos. I. Q. 91
Very alert when signal is given for reading.
Reads with ease both orally and silently.
Comprehends and enjoys stories read.
Grasps new words rapidly.
Reads to audience well.
Likes to dramatize stories read.

Case 8. Lena, Age 7 Yrs. 3 Mos. I. Q. 90
Is reluctant in getting down to work.
Responds well to motivation but often requires urging.
Shows inability to follow written or printed directions.
Frequent lapses of attention while reading.
Reads simple stories silently with ease.

Case 9. Mary, Age 7 Yrs. 5 Mos. I. Q. 88
Shows splendid attitude as to begin reading.
Ignores punctuation marks occasionally.
Reads simple stories with ease.
Will not try to attack hard words first.
Difficulties shown in phonic sounds.
Tell story read fluently.
Observes pictures keenly.

Case 10. Mary, Age 7 Yrs. 7 Mos. I. Q. 84
Dawdles before beginning to read.
Prefers looking at pictures rather than reading.
Is often indifferent to motivation.
Slow in making new words become sight words.
Reads silently with lip movement.
Breaks sentences without due regards to proper word grouping.
Uses finger for pointing.
Shows inability in giving letter sounds and blends.

Case 10. Bobbye, Age 7 Yrs. 4 Mos. I. Q. 76
Wastes time in getting to work.
Responds well to motivation but often requires urging.
Shows inability to follow directions carefully.
Misconstrues questions.
Reads simple stories with ease.
Recognizes sight words readily.

Case 12. James, Age 7 Yrs. 8 Mos. I. Q. 76
Wastes time when beginning to work.
Playful and mischievous.
Special selection of material given by teacher.
More interest shown in pictures.
Reads very simple materials with ease.
Shows difficulty with letter sounds.
Knows only a part of the letters.

Case 13. Joseph, Age 7 Yrs. 5 Mos. I. Q. 75
Gets down to work readily.
Shows interest in reading stories.
Learns new words rapidly.
Reads silently with few or no lip movements.
Understands and enjoys story read.
Discusses freely story read.
Recognizes sight words rapidly.

Case 14. Fannie, Age 8 Yrs. 1 Mo. I. Q. 74
Begins work eagerly at the given time.
Reads silently and orally with ease.
Interprets simple passages accurately.
Recognizes readily most of the sight words.
Follows printed or written directions easily.
Shows inability in learning longer new words.
Reads well to audience.

Case 15. Joe, Age 8 Yrs. 11 Mos. I. Q. 73
Wastes time in getting to work.
Prefers looking at pictures rather than reading.
Responds well to motivation only at times.
Is reluctant to read easy materials.
Shows difficulty in letter sounds and blends.
Listens with interest to stories read by others.
Answers questions readily on stories read.

Case 16. Robert, Age 7 Yrs. 11 Mos. I. Q. 72
Trifles when time to read.
Often indifferent to motivation.
Reads simple stories with ease.
Misconstrues questions on material read.
Gives inappropriate responses in terms of clue words or phrases.
Halts frequently during oral reading.
Depends habitually on others to supply words.

Case 17. Genevieve, Age 7 Yrs. 6 Mos. I. Q. 69
Begins work immediately.
Responds well to motivations but often requires urging.
Learns new words slowly.
Reads simple stories with ease.
Shows difficulties with letter sounds.
Confuses letters as "b" and "d," "p" and "q."
Recognizes sight words readily.

Case 18. Cornelius, Age 9 Yrs. 1 Mos. I. Q. 66
Dawdles before beginning to read.
Reads simple stories orally and silently with ease.
Understands and enjoys stories read.
Recognizes a number of sight words.
Answers questions readily on material read.
Shows inability in phonic sounds.
Tells story with ease.

Case 19. David, Age 9 Yrs. 7 Mos. I. Q. 65
Begins work at once.
Reads simple passages accurately.
Asks questions about and discusses stories read.
Interested in telling stories.
Makes errors occasionally on easy words.
Slow in learning new words.
Shows difficulty in letter sounds and blends.

Case 20. Carrie, Age 11 Yrs. 9 Mos. I. Q. 62
Begins work immediately.
Handles books with care.
Reads easy materials understandingly.
Shows difficulty in letter sounds and blending.
Interested more in hearing stories read than reading.
Breaks sentences up without due regards to proper grouping.
Shows minor mispronunciation.

Group B

Case 1. Richard, Age 7 Yrs. 11 Mos. I. Q. 121
Wastes no time in getting to work.
Takes obvious delight in reading.
Is interested in stories.
Answers questions based on readings readily.
Works rapidly and independently.
Discusses freely what is read.
Reads orally and silently with ease.
Recognizes new words with increasing speed.

Case 2. Evelyn, Age 7 Yrs. 1 Mo. I. Q. 102
Begins work immediately.
Reads aloud with good phrasing inflection and stress.
Understands and enjoys stories read.
Reads silently at ease.
Turns to reading at every opportunity.
Grasps new words readily.
Tells stories read fluently.
Asks questions about and discusses intelligently the contents of what is read.

Case 3. Christine, Age 7 Yrs. 9 Mos. I. Q. 100
Dawdles before beginning to read.
Responds well to motivation but sometimes requires urging.
Avoids reading whenever possible.
Likes to read certain things.
Reads silently with no lip movement.
Interprets simple passages with ease.
Shows inability to pronounce words readily.

Case 4. Annie, Age 7 Yrs. 7 Mos. I. Q. 91
Goes to work quickly when time comes for reading.
Reads orally and silently with ease.
Responds well to motivation.
Takes obvious delight in reading.
Learns new words rapidly.
Pronounces words distinctly.
Answers fact questions based on story read.

Case 5. O. J., Age 7 Yrs. 2 Mos. I. Q. 90
Dawdles before beginning to read.
Misconstrues questions on assignments.
Minor mispronunciation of easy words.
Shows ability to read and understand easy material.
Slow about discussing stories read.
Handles books with care.
Difficulties shown in letter sounds and blends.

Case 6. Verda, Age 7 Yrs. 8 Mos. I. Q. 87
Goes to work readily.
Takes obvious delight in reading.
Reads silently with few or no lip movements.
Reads aloud clearly and in thought units.
Talks with pleasure about material read.
Attacks new words with ease.
Dramatizes stories read well.

Case 7. Helen, Age 7 Yrs. 5 Mos. I. Q. 94
Goes to work immediately.
Reads silently and orally with ease.
Comprehends and enjoys reading.
Discusses freely what is read.
Reads voluntarily in various classroom activities.
Recognizes sight words readily.
Dramatizes stories well.

Case 8. Mary, Age 7 Yrs. 5 Mos. I. Q. 92
Quickly begins work.
Takes delight in reading.
Turns to reading at every opportunity.
Learns new words rapidly.
Reads silently and orally with ease.
Asks questions about and discusses intelligently contents of what is read.

Case 9. John, Age 7 Yrs. 8 Mos. I. Q. 91
Reluctant about getting down to work.
Reads stories with ease.
Interprets passages read accurately.
Is interested in animal stories.
Reads to audience well.
Recognizes new words with speed and accuracy while reading.

Case 10. Thomas, Age 7 Yrs. 4 Mos. I. Q. 77
Reluctant about getting down to work.
Is indifferent to motivation.
Reads easy material with emphasis.
Gives inappropriate responses in terms of clue words and phrases.
Interested in hearing stories read.
Shows frequent lapses in reading.

Case 11. Jessie, Age 7 Yrs. 4 Mos. I. Q. 76
Wastes time before beginning to read.
Frequently halts and hesitates during oral reading.
Shows habitual dependence on others to supply words in oral and silent reading.
Reads simple material fairly well.
Frequent lapses of attention while reading.
Shows difficulty in giving letter sounds.
Slow in making new words become sight words.

Case 12. Benjamin, Age 7 Yrs. 9 Mos. I. Q. 75
Begins work immediately.
Reads aloud with good phrasing inflection and stress.
Understands and enjoys stories read.
Discusses freely stories read.
Shows inability to follow printed or written directions.
Difficulties shown in attacking longer words.

Case 13. Billy, Age 9 Yrs. 4 Mos. I. Q. 75
Goes to work rather reluctantly.
Prefers to look at pictures rather than read.
Enjoys hearing stories read.
Tells story fluently after listening to story read.
Reads simple passages well.
Shows difficulty in following directions.
Names letters in difficult words.
Confuses letter sounds.
Knows only a few sight words.

Case 14. Junior, Age 8 Yrs. I. Q. 74
Reluctant about getting down to work.
Reads silently with vocalization.
Breaks sentences up frequently without regards to proper word grouping.
Learns new words rather slowly.
Responds to motivation but often requires urging.
Shows inability in word enunciation.

Case 15. William, Age 7 Yrs. 8 Mos. I. Q. 72
Goes to work immediately.
Reads aloud clearly and in thought units rather than by individual sounds.
Interprets passages of increasing difficulty.
Discusses freely what is read.
Turns to reading at every opportunity.
Is interested in stories.
Learns new words readily.

Case 16. Geneva, Age 7 Yrs. 1 Mo. I. Q. 71
Dawdles before beginning to read.
Shows inability to read anything except very simple material, however, cares only for material beyond her reading ability.
Avoids reading whenever possible.
Is indifferent to motivation.
Makes frequent errors on easy words.
Habitually adds words to readings.

Case 17. Coy, Age 8 Yrs. 8 Mos. I. Q. 67
Goes to work readily.
Reads rather haltingly and frequently ignores punctuation.
Reads very simple material with ease.
Shows difficulty in letter sounds and blends.
Rather slow in learning new words.
Shows frequent lapses of attention while reading.

Case 18. Woodrow, Age 11 Yrs. 4 Mos. I. Q. 65
Reluctant about beginning work.
Reads rather slowly.
Ignores punctuation frequently.
Avoids reading whenever possible.
Frequent lapses of attention while reading.
Is indifferent to motivation.
Is interested in telling stories after hearing them read.

Case 19. John, Age 9 Yrs. 8 Mos. I. Q. 64
Wastes a great deal of time before beginning to read.
Shows inability to read easy material.
Prefers to look at pictures rather than read.
Inappropriate responses given in terms of clue words or phrases.
Shows difficulty in letter sounds and blends.
Keeps place with finger.
Uses head and lip movements.

Case 20. Leon, Age 11 Yrs. 2 Mos. I. Q. 61
Begins work immediately.
Reads orally and silently with ease.
Understands and enjoys stories read.
Gives evidence of growing interest in reading.
Recognizes readily most of the sight words.
Turns to reading at every opportunity.
Learns new words rapidly.

CHAPTER III

DISCUSSION AND INTERPRETATION OF DATA

The I. Q. scores earned by the 40 pupils in this study were arranged in pairs in descending order for the convenience of matching. It may be seen in Table 1, page 33, that the means of the two groups were practically equal, Group A with a mean of 83.50, and Group B with a mean of 83.75. The difference between the mean is 0.25, favoring Group B. Since this small difference indicating the closeness of matching the two groups for general capacity is almost negligible, no further use will be made of the I. Q. scores in this discussion.

The results of the initial reading achievement test scores are also shown in Table 1, page 33. Group A had a mean score of 17.30 while Group B had a mean score of 16.65. The column of differences between the group pairs carried as a check on the difference between the means of the two groups. Thus, it may be seen at once that the difference between the means of the groups was equal to the mean of the column of difference by the separate pairs. This difference of 0.65 between the means of the two groups on the initial reading achievement test is noted as - 0.65, meaning that the difference is in favor of Group A, since the form B-A was used in computation. It will be noticed that Group A was slightly below Group B on the I. Q. matching scores, and, therefore was selected as the Experimental Group for the first period of study.

In Table 2, page 34, the results of the experiment after the first nine weeks are shown. Group A, experimental, under the situation of free reading has a mean of 26.90. This increase of 9.60 over the mean on the initial test of 17.30 amounts to an achievement gain of 55%. Group B,

TABLE 1

SHOWING THE INTELLIGENT SCORES, THE READING ACHIEVEMENT SCORES, AND THE MEAN FOR THE TWO GROUPS ON THE INITIAL TEST

Pair Number	I. Q.'s, Matching Scores		Reading Achievement Scores		Difference
	Group A	Group B	Group A	Group B	
1	123	121	23	34	11
2	104	102	14	24	10
3	100	100	39	16	-23
4	99	94	28	26	- 2
5	92	92	20	29	9
6	91	91	23	30	7
7	91	91	24	28	4
8	90	90	13	2	-11
9	88	87	10	27	17
10	84	77	13	12	- 1
11	76	76	15	11	- 4
12	76	75	2	18	16
13	75	75	13	3	10
14	74	74	23	8	-15
15	73	72	8	20	12
16	72	71	9	20	11
17	69	67	13	14	1
18	66	65	20	6	-14
19	65	64	17	3	-14
20	62	61	19	2	-17
Means	83.50	83.75	17.30	16.65	- 0.65

TABLE 2

SHOWING THE INDIVIDUAL SCORES, THE INDIVIDUAL GAINS, AND THE MEAN GAINS AND PER CENT GAIN BY THE EXPERIMENTAL GROUP AND THE CONTROL GROUP WITH 20 PAIRS OF PUPILS IN THE READING EXPERIMENT AFTER THE FIRST NINE WEEKS OF INSTRUCTION UNDER DIFFERENT METHODS

	Free Reading Experimental Group A			Restricted Reading Control Group B		
Pair Number	Initial Test	Intermediate Test	Gain	Initial Test	Intermediate Test	Gain
1	23	38	15	34	40	6
2	14	26	12	24	39	15
3	39	40	1	16	28	12
4	28	38	10	26	40	14
5	20	37	17	29	28	- 1
6	23	37	14	30	39	9
7	24	36	12	28	40	12
8	13	27	14	2	6	4
9	10	20	10	27	32	5
10	13	12	- 1	12	14	2
11	15	28	13	11	11	0
12	2	11	9	18	18	0
13	13	22	9	3	13	10
14	23	35	12	8	13	5
15	8	10	2	20	33	13
16	9	15	6	20	19	- 1
17	13	24	11	14	18	4
18	20	31	11	6	20	14
19	17	27	10	3	7	4
20	19	24	5	2	21	19
Mean	17.30	26.90	9.60	16.65	23.95	7.30
% Gain			55			44

control, under restricted reading has a mean of 23.95, showing an increase of 7.30 over the initial mean of 16.65. The reading achievement gain for Group B, control is 44%. See Figure 2, page 34 which is a diagram showing the comparative effect of free reading with restricted reading from the initial test through the intermediate test.

Thus, while Group A, experimental yields a gain of 55% under free reading, Group B, control yields a gain of 44% under restricted reading. It may also be stated in different form. The achievement in reading by Group B, control is 80% of the achievement by Group A, experimental, a ratio of 44 to 55.

In Table 3, page 36, the results of the experiment after the second nine weeks are shown. Group A, control under the condition of restricted reading, has a mean of 27.10. This increase of 9.80 over the mean on the initial test of 17.30 amounts to an achievement gain of 57%. Group B, experimental under free reading has a mean of 28.75 showing an increase of 12.10 over the initial mean of 16.65. The reading achievement gain for Group B, control is 73%. Figure 2, page 37, also shows the comparative effect of free reading with restricted reading from the initial test through the final test.

During the entire course of the experiment while Group A, control yields a gain of 57% under restricted reading, Group B, experimental yields a gain of 73% under free reading. It may also be stated in a different form. The achievement in reading by Group A, control is 78% of the achievement by Group B, experimental, a ratio of 57 to 73.

TABLE 3

SHOWING THE INDIVIDUAL SCORES, THE INDIVIDUAL GAINS, THE MEAN GAINS AND THE PER CENT GAIN BY THE EXPERIMENTAL GROUP AND THE CONTROL GROUP WITH 20 PUPIL PAIRS IN THE READING EXPERIMENT AT THE END OF 18 WEEKS UNDER DIFFERENT METHODS OF INSTRUCTION

	Restricted Reading Control Group A			Free Reading Experimental Group B		
Pair Number	Initial Test	Final Test	Gain	Initial Test	Final Test	Gain
1	23	39	6	34	40	6
2	14	25	11	24	36	12
3	39	38	- 1	16	39	23
4	28	36	8	26	39	13
5	20	35	15	29	32	3
6	23	39	16	30	39	9
7	24	37	13	28	39	11
8	13	24	11	2	15	13
9	10	24	14	27	37	10
10	13	15	2	12	20	8
11	15	30	15	11	20	9
12	2	15	13	18	25	7
13	13	18	5	5	20	17
14	23	31	18	8	24	16
15	8	14	6	20	35	15
16	9	17	8	20	27	7
17	13	25	12	14	24	10
18	20	28	8	6	25	19
19	17	27	10	3	12	9
20	19	25	6	2	27	25
Mean	17.30	27.10	9.80	16.65	28.75	12.10
Gain			57%			73%

FIGURE 2

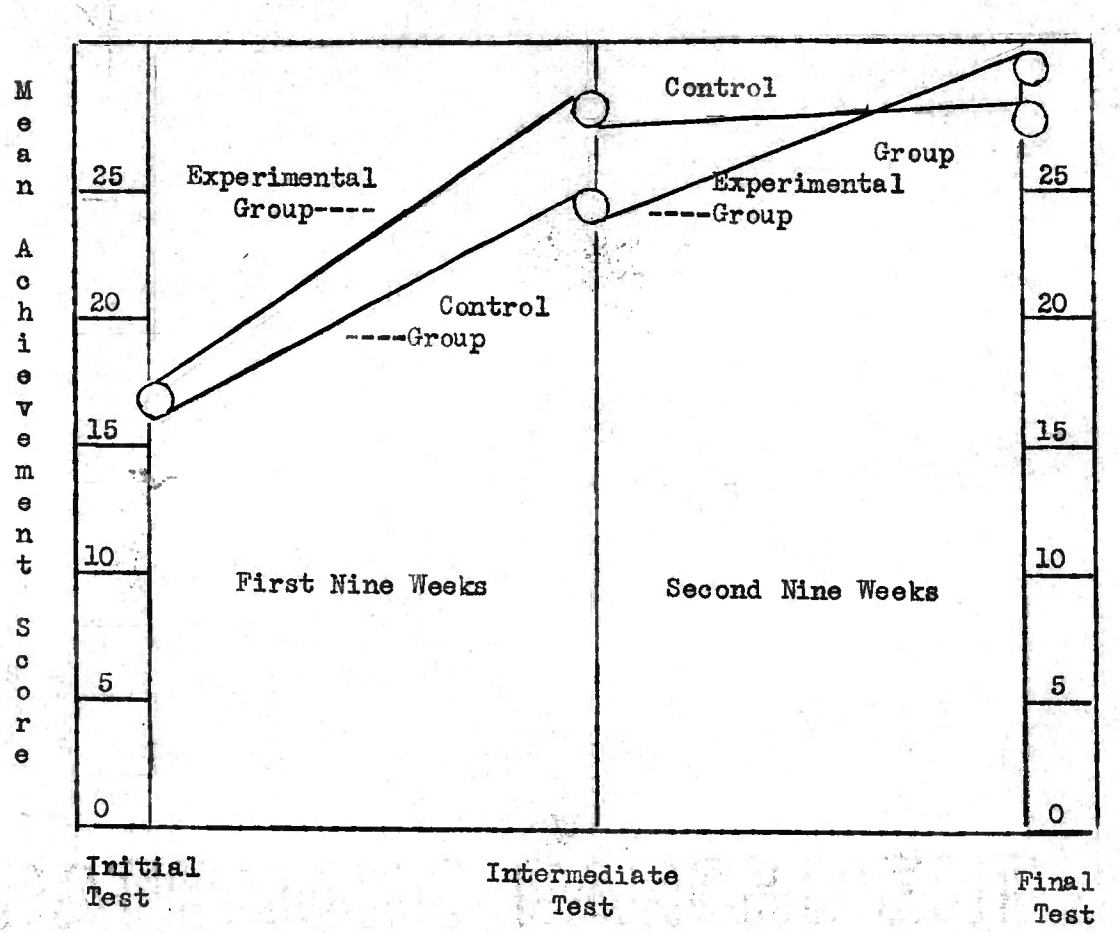

Fig. 2.- Diagram Showing the Comparative Effect of Free Reading with Restricted Reading in the Reading Experiment.

CHAPTER IV

SUMMARY AND CONCLUSION

This study is an experiment comparing the relative growth in reading vocabulary among forty second-grade children in Emmett Scott School, Rock Hill, South Carolina to determine the better technique for vocabulary development.

The Pintner-Cunningham Primary Test, Form B was given the subjects. The scores on the intelligence test in terms of I. Q.'s were arranged in descending order and the odds and evens were matched forming two groups. Scores were used for matching purposes only.

The Detroit Word Recognition Test, Form B was administered to all the subjects. For study the groups were known as Group A and Group B. The first nine weeks Group A was the experimental or free readers while Group B was the control or restricted readers. The experimental or free reading group made a selection of new words from their readings. The control or restricted reading group's selection of new words were taken from the teacher's manual and glossary. Thirty minutes were used for recitations.

A second form of the test was given the groups at the end of the nine week period. The groups were rotated. Group A, experimental became Group A, control, or restricted readers. Group B, control became Group B, experimental or free readers.

At the end of the second nine weeks period a third form of the test was given all the subjects. Scores were tabulated and comparisons made.

The achievement scores at the beginning showed that there was a slight difference between the means of the two groups. Group A, experimental with an initial mean of 17.30 reached a mean score of 26.90, at the

intermediate test with a mean gain of 9.60, or an achievement gain of 55%. Group B, control with an initial mean of 16.65 reached a mean score of 23.95 with a mean gain of 7.30 or an achievement gain of 44%.

In the final stage, after the rotation of groups, Group A, now control reached a mean score of 27.10 over the initial mean with a mean gain of 9.80, or an achievement gain of 57%. Group B, now experimental reached a mean score of 28.75 over the initial mean with a mean gain of 12.10 or an achievement of 73%.

At the intermediate stage this study reveals the rates of the per cent gain by the control, or restricted readers to the per cent gain by the experimental group or free readers is 44 to 55, or the control group was 80 % as efficient as the experimental group.

The ratio of per cent gain in achievement by the control group, or restricted readers to the per cent gain in achievement by the experimental group at the final stage is 57 to 73 or that the control group was 78% as efficient as the experimental group.

If the two groups of free readers be considered as a single group and the two groups of restricted readers be considered as a single group the free readers will show a gain of 11.45 or an achievement gain of 66.2%. The restricted readers will show a gain of 10.45 or, an achievement gain of 62.7%.

When forty second grade children are divided into two groups, free readers and restricted readers, and taught for a period of eighteen weeks, the free readers will excel the restricted readers in reading achievement.

The restricted readers will achieve 90% of the amount acquired by the free readers.

APPENDIX

BOOKS IN CLASSROOM LIBRARY

BASIC TEXT-BOOKS AND CHARTS

Books in Classroom Library

Name	Author	Company
At Home And Away	Smith	Silver Burdett
Art Stories, Book II	Whitford, Lick, Gray	Scott Foresman
Adventures in Science With Bob and Don	Carpenter, Bailey	Allyn & Bacon
Child Story Reader	Freeman, Storm	Lyons & Carngham
David Friends At School	Hanna, Anderson	Mcmillan
Down The River Road	Donnell	Row & Peterson
Enjoying Our Land	Bush	Macmillan
Fun With Dick And Jane	Gray, Arbuthrat	Scott Foresman
Facts And Story Reader	Davidson	American Book Co.
Health Stories, Book II	Beaucamp, Gray	Scott Foresman
Hiawatha Primer	Holbrook	Ginn & Company
In City And Country	Smith	Silver Burdett
Pathway To Reading	Blacks, Uhl, Hosic	Silver Burdett
Playing Together	_____	Macmillan
Picture Stories of Our Neighbors	_____	Scott Foresman
Negro Reader Series, "Gifts"	Akins	_____
Red Feather	Morecomb	Lyons & Carngham
Round About You	Smith	Silver Burdett
Story Hour Reader	Buswell	Wheeler Publishing
The Bolenius Readers	Bolenius	Houghton Mifflin
The Silent Reader Hour	Buswell	Wheeler Publishing
The Find Out Book	_____	Macmillan

Books (continued)

Name	Author	Company
Webster Reader, Book II	Webster	Webster

Magazines

Playmates

Wee Wisdom

Newspapers

My Weekly Reader Two

Primary Life (a school paper edited by the Primary class)

Basic Text-books

Gates - Huber, Work and Play Book

Story Study Second Reader, Trips to Take

New Elson Second Reader, "Friends and Neighbors."

New Elson Second Reader, "More Friends and Neighbors."

Charts On Important Dates And Events

Lincoln's Birthday

St. Valentine Day

Washington's Birthday

President Roosevelt's Birthday

President Roosevelt's Death

V. E. Day

Child Health Day

Mother's Day

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Pintner-Cunningham Primary Test

By RUDOLF PINTNER, PH.D.
Professor of Educational Psychology, Teachers College, Columbia University

BESS V. CUNNINGHAM, PH.D.
Professor of Education, University of Toledo

and WALTER N. DUROST, PH.D.
Formerly Research Associate, Institute of School Experimentation
Teachers College, Columbia University

MANUAL OF DIRECTIONS AND KEY

I. THE COMPLETE SERIES

The Pintner General Ability Tests, Verbal Series, have been developed to fulfill modern requirements for a complete series of group tests of general intellectual ability or aptitude covering all levels from kindergarten age to maturity. For convenience in administration and in order to provide tests which are long enough to be reliable, the series is organized into several batteries, each of which covers an ability range of three or four school grades. All batteries yield scores on a single standard score scale; thus direct comparability of results from one battery to another is made possible.

Each battery of the series provides for measurement of a variety of skills or abilities which constitute different aspects of the composite quality which is usually termed general mental ability. All the tests in this series are essentially verbal in nature, requiring an understanding of language. Brief descriptions of the batteries which comprise the Pintner General Ability Tests, Verbal Series, are given below. More detailed information concerning the nature of the different tests, their standardization, the derivation of the standard score scale, validity and reliability, is contained in the Manual for Interpreting published for the series.

Pintner-Cunningham Primary Test. This test for kindergarten, Grade 1, and the first half of Grade 2 is published in two equivalent forms, Form A and Form B. It is composed entirely of pictures, which are marked by the pupils according to the examiner's verbal directions. It contains seven different subtests covering as many different aspects of general mental ability.

Pintner-Durost Elementary Test. This test for the last half of Grade 2, Grade 3, and the first half of Grade 4 is published in two equivalent forms, Form A and Form B. It is made up of two parts — the Picture Content Scale consisting entirely of material presented orally by the teacher with responses indicated by the child largely through the medium of pictures, and the Reading Content Scale, comprising six tests similar in form to those of the Intermediate and Advanced Tests. The two scales are published separately but may be used in conjunction to discover pupils of good native ability who are handicapped by lack of reading skill.

Pintner Intermediate Test. This test for Grades 4^5 to 9^5 inclusive is published in two equivalent forms, Form A and Form B. It measures eight different aspects of general mental ability through the following eight subtests: Vocabulary, Logical Selection, Number Sequence, Best Answer, Classification, Opposites, Analogies, and Arithmetic Reasoning. This test is semi-self-administering, in that all instructions concerning the method of response are given prior to the pupils' beginning the test. All items are of the five-alternative-answer type, which permits arrangement for rapid scoring by means of a perforated stencil key.

Pintner Advanced Test. This test for Grade 9 and above is published in two equivalent forms, Form A and Form B. It is similar to the Pintner Intermediate Test described above and may be considered for all practical purposes an extension of that test to higher ability levels.

II. CHARACTERISTICS OF THE PINTNER-CUNNINGHAM PRIMARY TEST

When the teacher is confronted with a new group of children at the beginning of the school year, it is of great value to her to know the general mental ability of each child. This is of special importance with children who are just entering school, because for them there are no records of previous school work. Hence the importance of intelligence testing in the kindergarten and first grade, where the Pintner-Cunningham Primary Test is designed to be used.

I. VALIDITY

One important question which must be answered positively if a test is to be of any real value is: Does the test measure what it purports to measure? Does a so-called intelligence test measure intelligence, or is reading ability or some other skill being tested? To find the answer to

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this question is not an easy task, for intelligence cannot be isolated and measured directly. However, evidence from many different sources supports the claims made for the validity of the Pintner-Cunningham Primary Test.

In the first place, a group test for measuring the intelligence of kindergarten and first-grade children should meet certain criteria regarding its general make-up. Certainly no knowledge of words or numbers should be required; the method of indicating responses should be so easy that even the child with poor muscular development and control is not handicapped; the material should be so interesting to young children that their complete coöperation is easily obtained; and the material should be so arranged and presented that the child feels that he is succeeding throughout the entire test.

All these criteria are satisfied by the Pintner-Cunningham Primary Test. Only pictures of familiar objects and simple figures are used throughout the test. Except in the one subtest measuring eye and muscular coördination, the answer is indicated by a single mark. Directions are given for each subtest and for each part of the subtest in most instances, and generous time is allowed, thus assuring that each pupil will have an opportunity to answer each item of the test and that he will feel that he has done successfully what was asked of him.

Secondly, the items of a valid intelligence test must be logically and closely related to intelligence. Moreover, since it has been found that different stages of mental growth are characterized by the ability to do certain mental tasks, an intelligence test for a given age group must be composed of mental tasks peculiar to the mental development of average children of that age. Thus, an intelligence test for five- and six-year-old children must not be cluttered with items requiring mature mental development to answer, nor with items which practically all two-year-old children can do. The Pintner-Cunningham Test is divided into seven subtests: (1) Common Observation, (2) Æsthetic Differences, (3) Associated Objects, (4) Discrimination of Size, (5) Picture Parts, (6) Picture Completion, and (7) Dot Drawing. A study of the abilities measured by these subtests convinces one that they are closely associated with intelligence. Many other phases of intelligence might have been included, but these seven have proved to be highly discriminative at this age level. The average three-year-old child finds these subtests extremely difficult, while the average nine-year-old finds them quite easy.

The third type of evidence of the validity of a test is afforded by statistical data. If a perfect test of intelligence were known, the validity of a new intelligence test could be accurately measured by determining its correlation with this ideal test. No perfect intelligence test is known, but many consider the Stanford Revision of the Binet Scale the best measure of intelligence available. Below are summarized the results of three studies in which the validity of the Pintner-Cunningham Test has been checked by correlating it with the Stanford-Binet. The original edition of the Pintner-Cunningham Test was used in these studies, but since the present revised Form A is practically the same as the original test, these results are still pertinent.

Author	*r*	Group
Dougherty [1]	.80	Kindergarten
Pintner [2]	.73	229 Cases
Pintner [2]	.88	72 Cases

If, as is commonly assumed to be the case, an intelligence test measures ability to succeed in school work, the correlation between the intelligence test results and achievement test results should be positive and high, although not perfect, since the tests are not supposed to be measuring identical abilities. Grant [3] found that the correlation between reading test scores and mental ages obtained from the Pintner-Cunningham Primary Mental Test administered to 260 first-grade pupils was .63, which provides a further check on the validity of the Pintner-Cunningham Test.

2. RELIABILITY

Not only must an intelligence test be valid, but it must also be a reliable measure. By reliability is meant the extent to which repeated administrations of the same test to the same population will yield consistent results. In the case of the Pintner-Cunningham Primary Test, reliability data are available in the form of correlations between alternate forms, retest correlations, and probable errors of test scores. Certain of these reliability coefficients are given in Table 1. The data shown in this table indicate a satisfactory degree of reliability for most school purposes; naturally, an even more reliable result can be obtained by administering both forms of the test and averaging the results.

The probable error of measurement expressed in terms of standard scores [4] is 3.6. This has been computed

TABLE 1

Coefficients of Correlation between Pintner-Cunningham Primary Test: Form A (Revised) and Other Forms

Correlation with	Number	Grade	Coefficient
Form B	60	K	.88
Form B	104	I	.89
Form B	93	II	.83
Original form	216	K–II	.94

[1] Dougherty, M. L., *A Comparative Study of Nine Group Tests of Intelligence for Primary Grades.* Johns Hopkins Press, Baltimore.

[2] Pintner, R., "The Pintner-Cunningham Primary Test," *Journal of Educational Psychology*, Vol. 18, pages 52–58.

[3] Grant, Albert, "The Comparative Validity of the Metropolitan Readiness Tests and the Pintner-Cunningham Primary Mental Test," *Elementary School Journal*, Vol. XXXVIII, No. 8, pages 599–605.

[4] The standard score scale is described in greater detail in the following section.

from the formula, $P.E._{M.} = .6745\,\sigma_{Test}\sqrt{1 - r_{11}}$, where $\sigma_{Test} = 16$ and $r = .89$. The probable error gives us some idea of the fluctuation that may be expected in individual scores due to random errors. Usually no deviation less than three times its probable error is considered large enough statistically to merit attention. The probable error of measurement is useful to the teacher or administrator in that it tells how much an obtained score might be expected to vary if the test were administered a second time to the same child without any influence of practice effect. The probable error should certainly always be kept in mind when the test results of "borderline" children are being interpreted.

3. THE STANDARD SCORE SCALE

A standard score scale has been established for the series of batteries of the Pintner General Ability Tests in order that the scores may be expressed in units that are approximately equal at all points along the scale. The procedure followed in the establishment of the standard score scale for the Pintner-Cunningham Primary Test was essentially the same as that used in scaling the Pintner Intermediate and Advanced Tests of the series.[1] It involved the selection of a single age group and the assignment of values to the median and standard deviation of the distribution of raw scores of this group, which values would yield a scale having the desired characteristics.

A scaling population was obtained from pupils of Elizabeth, New Jersey, where extensive testing throughout the school system has given clear evidence that this city represents a typical community according to the established norms of the Pintner Intermediate and Advanced Tests. The Pintner-Cunningham Primary Test was administered to the entire kindergarten and first and second grades of Elizabeth — a total of 3053 children. From this group were selected those pupils, 931 in all, whose ages ranged from 6 years 0 months to 6 years 11 months — this age range having been found to be the most completely represented in these grades. The distribution of scores of this scaling population formed the basis for the standard score scale.

The first requirement of the standard score scale for the Pintner-Cunningham Test was that it be continuous with the scale already established for the other tests of the Pintner series and constitute a downward extension of that scale. To this end, the norm line (the relation of standard scores to age) for the other tests in the series was extrapolated downward to yield an estimate [2] of the standard score which would be normal for children 6 years, 6 months, of age — i.e., for children of the same age as the median age of the scaling population. This estimated value, 93, was then assigned to the median raw score of the scaling population.

The other important characteristic desired of the standard score scale was that it yield scores for successive age groups that would have the same standard deviation as the scores on the Pintner Intermediate and Advanced Tests for single age groups. This value had been previously determined to be 16 points; therefore a standard deviation of 16 was assigned to the distribution of Pintner-Cunningham scores for the scaling population. Thus, having determined on values for the median and standard deviation, it was possible to assign a standard score to each Pintner-Cunningham raw score.

4. EQUIVALENCE OF FORMS

The Pintner-Cunningham Primary Test is now available in two forms, Form A and Form B. Form A is like the original Pintner-Cunningham Primary Mental Test except that all the pictures have been redrawn and new items have been substituted for certain obsolete items in the original form. Form B parallels Form A in general content, but the material is new and different. The two forms are of equal difficulty, and the norms given in Table 4 are applicable to both. In cases where it is desired to retest pupils after an interval of time, the alternate form is of great value. It also provides a means of retesting those pupils whose scores on one form seem doubtful, without using material which will be familiar to them. In such cases the average of the results on the two tests is usually considered the most reliable estimate of a child's intelligence.

III. Directions for Administering

The number of kindergarten children that should be tested at any one time will depend upon the skill of the examiner and the amount of assistance available. If the examiner is alone, probably not more than ten or fifteen children should be examined together. If there are one or two assistants to help in seeing that the children have turned to the right page, then a group of twenty or thirty may be handled. Maximum efficiency in administering these tests strongly argues in favor of limiting the group, in grades below the second, to not more than ten or fifteen children. Local conditions may argue in favor of smaller numbers; e.g., children with poor home backgrounds or children who are seriously retarded should be tested in smaller groups.

Seat children so as to mimimize chances for copying from one another. Provide the children with soft pencils or sharp crayons. See that each child's name is written on his booklet. Additional data as to age, grade, etc., should be obtained from the teacher at another hour. Distribute the test booklets, and ask that they be kept closed until further directions are given. Be very deliberate in giving all directions. Everything that is to be

[1] This procedure is described in detail in the Manual for Interpreting the Pintner General Ability Tests.

[2] The original extrapolation of the norm line was made without benefit of data on the Elementary Test. A subsequent check, using data incidental to the standardization of the Pintner-Durost Elementary Test, has established the validity of the first extrapolation. The experimental work and statistical procedure involved is fully described in the Manual for Interpreting the Pintner General Ability Tests.

said to the children is printed in boldface type. Do not read anything else to the children.

DIRECTIONS FOR FORM A

When the booklets have been distributed, say: **We are going to play some games with the pictures in this book. We are going to mark in this book. Listen carefully to everything I say so you will mark just the right things. Open your books** (Illustrate by turning to page 2.) **and fold them back like this, so you can see a pair of scissors.** (See that all have the right page.)

Test 1. Common Observation (pages 2 and 3)

Page 2. **Look at the pictures at the top of the page.** (Indicate the first row, page 2.) **We are going to put some marks on some of the pictures, but not on *all* of them. Let's mark the things that Mother uses when she sews her apron. Can you find the scissors? Put your finger on it. Mark it like this.** (Draw line on board.) **Mark just the scissors and not anything else.** (See that all have followed directions. Any kind of mark that indicates the object is satisfactory.) **Now we are going to look for something else that she would need to use in sewing her apron. She would not need a coffeepot. We must not mark it. Would she need a thimble? Yes, mark it.** (Pause.) **She would not need a kettle. Do not mark the kettle. There are two more things that she would need to sew her apron. Find them and mark them. Be careful — mark just the right things.** (Allow a reasonable time.)

Now look at the rest of the pictures on this page. These pictures show some things that *have* feathers and some that do *not* have feathers. Find all the things that have feathers, and mark them. Go ahead! (Time, 30 seconds.)

Page 3. **Turn over your books, so you can find an airplane. These pictures show some things that go up into the air. Find them and mark each thing that goes up into the air. Go ahead!** (Time, 30 seconds.) **Turn over the page like this. Fold your books back so you can see the elephants.**

Test 2. Æsthetic Differences (pages 4 and 5)

Page 4. **This is a different game. Look at the three little girls at the top of the page.** (Point.) **I want you to find the prettiest. Don't tell any one, but look at all the girls. Then put a mark on the prettiest girl. Go ahead!** (Wait until all have finished.) **Now look at all the elephants. Mark the prettiest elephant.** (Pause not longer than 10 seconds.) **Look at all the houses. Mark the prettiest house.** (Pause 10 seconds.)

Page 5. **Turn your books over, so you can see some flowers. Look at all the flowers. Mark the prettiest flower.** (Pause 10 seconds.) **Look at all the strings. Mark the prettiest string.** (Pause 10 seconds.) **Look at all the dancers. Mark the prettiest dancer.** (Pause 10 seconds.) **Turn over the page and fold your books back, so you can see a hat.**

Test 3. Associated Objects (pages 6 and 7)

Page 6. **Here are pictures of some things that belong together.** (Point to first row.) **There are *two* things that belong together in this row. Let's see if we can find them — a coat and a hat — a pan — a hammer. Put a mark on the hat. Now mark something that belongs with the hat.** (Time, 15 seconds.) **Look at the next row. Find *two* things that belong together, and mark them.** (Time, 15 seconds.) **Look at the next row. Mark the two things that belong together.** (Time, 15 seconds.) **Turn your books over, so you can see a nail.**

Page 7. **Find the *two* things that belong together in the top row. Mark them.** (Time, 15 seconds.) **Find the *two* things that belong together in the next row. Mark them.** (Time, 15 seconds.) **Find the *two* things that belong together in the next row. Mark them.** (Time, 15 seconds.) **Turn over the page and fold your books back, so you can see a doll.**

Test 4. Discrimination of Size (page 8)

Page 8. **Here is a doll and some doll clothes. Look at the dresses. One dress is too big for this doll, one is too little, and one is just right. Find the dress that is just right. Put a mark on it.** (Time, 15 seconds.) **Look at the hats. Mark the hat that is just right.** (Time, 15 seconds.) **Look at the shoes. Mark the pair of shoes that is just right.** (Time, 15 seconds.) **Look at the gloves. Mark the pair that is just right.** (Time, 15 seconds.) **Turn your books over, so you can see a girl and a squirrel.**

Test 5. Picture Parts (pages 9, 10, and 11)

(Here the method of giving is very important.)

Page 9. **Put your finger on the little picture of a girl and a squirrel.** (See that all do it.) **Put a mark on the little girl who is looking at a squirrel.** (Pause.) **Now find another little girl just like her. Mark her.** (Pause.) **Find one other thing *outside* the little picture that is just like something *in* the little picture, and mark it.** (Time, 30 seconds.)

Look at the next picture, of a boy riding on a pig. Mark the pig. (Pause.) **Now find another one just like it outside the little picture. Mark it.** (Pause.) **Now look at the little picture again. See just what belongs in the picture. You have marked the pig. Find two more things that belong to the little picture. Find them *outside* the little picture and mark them. Go ahead!** (Time, 30 seconds.) **Turn over the page and fold your books back, so you can see a boy beating a drum.**

Page 10. **Look at the picture of a boy beating a drum. Look at the little picture. See just what belongs to the little picture, then find the same things *outside* the little picture. Mark them. Go ahead!** (Time, 30 seconds.)

Now look at the Christmas picture. See how many things belong to the little Christmas picture. Find them all *outside* and mark them. Go ahead! (Time, 45 seconds.) Turn your books over, so you can see a boy blowing bubbles.

Page 11. Look at the bubble picture. See how many things belong to this picture. Now find all of the same things outside. Mark them. Be very careful to find them all. Go ahead! (Time, 1 minute.) Turn over the page and fold your books back, so you can see a wooden doll.

Test 6. Picture Completion (pages 12, 13, and 14)

Page 12. Here is a picture of a wooden doll. Something is gone. What is it? (Wait for an answer.) Yes, its head is gone. Can you find it? Put a mark on the head that belongs to the doll. (Time, 10 seconds.)

Look at the next doll. Something is gone from this doll. Don't tell anyone, but see if you can find just what is gone. Mark it. (Time, 10 seconds.)

Look at the last doll. Find what is gone from this doll and mark it. (Time, 10 seconds.) Turn your books over, so that you can see a duck.

Page 13. Look at the picture of the duck. Find what is gone from the duck, and mark it. (Time, 10 seconds.)

Look at the man. Find what is gone from *the picture of the man* and mark it. (Time, 10 seconds.)

Look at the cherries. Mark what is gone. (Time, 10 seconds.) Look at the boy. Mark what is gone. (Time, 10 seconds.) Turn over the page and fold your books back, so you can see some lines.

Page 14. Look at these four pictures. There is something gone from each one. Find what is gone, and mark it. Look at my book. Mark what is gone from this one — then this one — then this one — and this one. (Indicate all.) Go ahead. (Time, 1 minute for this page.) Turn your books over, so you can see some dots.

Test 7. Dot Drawing (pages 15 and 16)

Page 15. We are going to draw some pictures just like the pictures on this page. Do you see how the chair is made? The lines are drawn to the dots. Here are some dots to make another chair just like this one. Draw a chair here. (Indicate dots opposite chair.) Make it exactly like this one. (No time limit.)

Now look at the star. See just how it is drawn. In these dots make another one just like it. (Time, 15 seconds.)

Now look at the square and the house. Draw a square here and a house here. Go ahead! (Time, 30 seconds for both.) Turn over the page.

Page 16. Here are four more pictures to draw. Look at each one. See just how it is drawn. Draw the four pictures in the dots on this page — Look, draw them here and here and here and here. Go ahead! (Time, 2 minutes for the page.) Stop.

(Collect the booklets. Be sure that each child's name has been written on the booklet by the teacher.)

DIRECTIONS FOR FORM B

When the booklets have been distributed, say: We are going to play some games with the pictures in this book. We are going to mark in this book. Listen carefully to everything I say so you will mark just the right things. Open your books (Illustrate by turning to page 2 and folding back the book.) and fold them back like this, so you can see an umbrella. (See that all have the right page.)

Test 1. Common Observation (pages 2 and 3)

Page 2. Look at the pictures at the top of the page. (Indicate the first row, page 2.) We are going to put some marks on some of the pictures, but not on *all* of them. Let's mark the things that we need when we go out in the rain. Can you find the umbrella? Put your finger on it. Mark it like this. (Draw line on board.) Mark just the umbrella and not anything else. (See that all have followed directions. Any kind of mark that indicates the object is satisfactory.) Now we are going to look for something else that we would need to go out in the rain. We would not need a broom. We must not mark it. Would we need rubbers? Yes, mark them. (Pause.) There are two more things that we would need when we go out in the rain. Find them and mark them. Be careful — mark just the right things. (Allow a reasonable time.)

Now look at the rest of the pictures on this page. These pictures show some things that grow in the ground and some that do *not* grow in the ground. Find all the things that grow in the ground, and mark them. Go ahead! (Time, 30 seconds.)

Page 3. Turn over your books, so you can find a duck. These pictures show some things that belong in the water. Find them and mark each thing that belongs in the water. Go ahead! (Time, 30 seconds.) Turn over the page like this. Fold your books back so you can see the boys.

Test 2. Æsthetic Differences (pages 4 and 5)

Page 4. This is a different game. Look at the three little boys at the top of the page. (Point.) I want you to find the prettiest. Don't tell anyone, but look at all the boys. Then put a mark on the prettiest boy. Go ahead! (Wait until all have finished.) Now look at all the camels. Mark the prettiest camel. (Pause not longer than 10 seconds.) Look at all the wheelbarrows. Mark the prettiest wheelbarrow. (Pause, 10 seconds.)

Page 5. Turn your books over, so you can see some vases. Look at all the vases. Mark the prettiest vase. (Pause 10 seconds.) Look at all the leaves. Mark the prettiest leaves. (Pause 10 seconds.) Look at all the girls roller-skating. Mark the prettiest girl. (Pause 10 seconds.) Turn over the page, and fold your books back so you can see a knife.

Test 3. Associated Objects (pages 6 and 7)

Page 6. Here are pictures of some things that belong together. (Point to first row.) There are *two* things that belong together in this row. Let's see if we can find them — a knife and a fork — a ball — a hat. Put a mark on the fork. Now mark something that belongs with the fork. (Time, 15 seconds.) Look at the next row. Find *two* things that belong together, and mark them. (Time, 15 seconds.) Look at the next row. Mark the two things that belong together. (Time, 15 seconds.) Turn your books over, so you can see a key.

Page 7. Find the *two* things that belong together in the top row. Mark them. (Time, 15 seconds.) Find the *two* things that belong together in the next row. Mark them. (Time, 15 seconds.) Find the *two* things that belong together in the next row. Mark them. (Time, 15 seconds.) Turn over the page and fold your books back, so you can see a man.

Test 4. Discrimination of Size (page 8)

Page 8. Here is a man and some clothes for the man. Look at the coats. One coat is too big for this man, one is too little, and one is just right. Find the coat that is just right. Put a mark on it. (Time, 15 seconds.) Look at the hats. Mark the hat that is just right. (Time, 15 seconds.) Look at the shoes. Mark the pair that is just right. (Time, 15 seconds.) Look at the gloves. Mark the pair that is just right. (Time, 15 seconds.) Turn your books over, so you can see a boy and a swan.

Test 5. Picture Parts (pages 9, 10, and 11)

(Here the method of giving is very important.)

Page 9. Put your finger on the little picture of a boy and a swan. (See that all do it.) Put a mark on the little boy that is looking at the swan. (Pause.) Now find another little boy that is just like him. Mark him. (Pause.) Find one other thing *outside* the little picture that is just like something *in* the little picture, and mark it. (Time, 30 seconds.)

Look at the next picture, of a girl riding on a donkey. Mark the donkey. (Pause.) Now find another one just like it *outside* the little picture. Mark it. (Pause.) Now look at the little picture again. See just what belongs in the picture. You have marked the donkey. Find two more things that belong to the little picture. Find them *outside* the little picture and mark them. Go ahead! (Time, 30 seconds.) Turn over the page and fold your books back, so you can see a picture of a boy and a girl feeding a kitty.

Page 10. Look at the picture of a boy and a girl feeding a kitty. Look at the little picture. See just what belongs to the little picture, then find the same things *outside* the little picture. Mark them. Go ahead! (Time, 30 seconds.)

Now look at the picture with the toys. See how many things belong to this little picture. Find them all *outside* and mark them. Go ahead! (Time, 45 seconds.) Turn your books over, so you can see a boy sailing a boat.

Page 11. Look at the picture of a boy sailing a boat. See how many things belong to this picture. Now find all of the same things outside. Mark them. Be very careful to find them all. Go ahead! (Time, 1 minute.) Turn over the page and fold your books back, so you can see a wooden doll.

Test 6. Picture Completion (pages 12, 13, and 14)

Page 12. Here is a picture of a wooden doll. Something is gone. What is it? (Wait for an answer.) Yes, its head is gone. Can you find it? Put a mark on the head that belongs to the doll. (Time, 10 seconds.)

Look at the next doll. Something is gone from this doll. Don't tell anyone, but see if you can find just what is gone. Mark it. (Time, 10 seconds.)

Look at the last doll. Find what is gone from this doll and mark it. (Time, 10 seconds.) Turn your books over, so you can see a rooster.

Page 13. Look at the picture of the rooster. Find what is gone from the rooster, and mark it. (Time, 10 seconds.)

Look at the woman. Find what is gone from the *picture of the woman* and mark it. (Time, 10 seconds.)

Look at the flower. Mark what is gone. (Time, 10 seconds.) Look at the boy. Mark what is gone. (Time, 10 seconds.) Turn over the page and fold your books back, so you can see some lines.

Page 14. Look at these four pictures. There is something gone from each one. Find what is gone, and mark it. Look at my book. Mark what is gone from this one — then this one — then this one — and this one. (Indicate all.) Go ahead. (Time, 1 minute for this page.) Turn your books over, so you can see some dots.

Test 7. Dot Drawing (pages 15 and 16)

Page 15. We are going to draw some pictures just like the pictures on this page. Do you see how the table is made? The lines are drawn to the dots. Here are some dots to make another table just like this one. Draw a table here. (Indicate dots opposite table.) Make it exactly like this one. (No time limit.)

Now look at the cross. See just how it is drawn. In these dots make another one just like it. (Time, 15 seconds.)

Now look at this picture here and this picture here (pointing to the two lower figures). Draw this one here and this one here (pointing). Go ahead! (Time, 30 seconds for both.) Turn over the page.

Page 16. Here are four more pictures to draw. Look at each one. See just how it is drawn. Draw the four pictures in the dots on this page — Look, draw them here and here and here and here. Go ahead! (Time, 2 minutes for the page.) Stop.

(Collect the booklets. Be sure that each child's name has been written on the booklet by the teacher.)

IV. Directions for Scoring

1. General Directions

The total raw score, which is the sum of the scores in the seven subtests, must be obtained for each test. The score in each subtest, except Tests 1 and 5, is simply the "number right"—that is, the number of correct responses. Keys showing the correct responses for Form A and Form B are given in Table 2 and Table 3, respectively.

The scorer should mark one test booklet as indicated in the scoring schedule and use the marked copy for scoring. In scoring, accept any kind of mark made by the child in all subtests except Test 7.

In Tests 1 and 5 the score is obtained by subtracting the "wrongs" from the "rights" and dividing by 2. A "right" is a response in which an object that should be marked is marked. A "wrong" is a response in which an object is marked that should not be marked. Objects that are not marked do not count as either right or wrong. In these two subtests, count the total number of right responses and the total number of wrong responses. Subtract the total number wrong from the total number right and *divide this difference by 2.*

If the number of wrongs exceeds the number of rights, the score is zero. No negative scores are given.

It is suggested that each correct response be indicated by a check mark or a straight line, and each incorrect response (wrong) in Tests 1 and 5 be indicated by a cross or a zero. This will distinguish wrongs from rights very clearly.

Record the score in each subtest in the space provided in the lower corner of the last page of that subtest. Transfer the scores for each subtest to the first page of the test booklet and add them to find the total raw score. Neglect fractions in the total; that is, add another half point to any total score containing half a point.

By means of Table 4 read off the standard score corresponding to each total raw score, and record on the front of the test booklet.

2. Specific Directions

In Test 2 a row is not correct if more than one object is marked.

In Test 3 a row is not correct if only one object is marked, or if more than two objects are marked.

In Test 4 a response is not correct if more than one dress or coat, etc., is marked.

In Test 5 disregard any marks a child makes inside the picture.

In Test 6 a response is not correct if more than one object in a section is marked. However, disregard any marks a child makes on the picture from which a part is missing. For example, on page 13 of the Form A test booklet, lower right, if the child marks the flag or boy and also marks the flag stick, count the item as correct. In the same section of the Form B test booklet, if the child marks the wagon or boy and also marks the wagon handle, count the item as correct.

In Test 7 the lines must be drawn to the dots as in the copy. Be sure that no lines are omitted. If additional lines are drawn, score the item correct, provided the essential lines are all drawn. If the object is correctly drawn but in the wrong set of dots, count the response as right. If the object is correctly drawn in a set of dots which the child makes, score the item correct.

V. Norms and Interpretation of the Results

1. Present Pintner-Cunningham Norms [1]

The derivation of the standard score scale for the Pintner-Cunningham Primary Test has already been discussed. (See page 3.) Mental ages corresponding to standard scores were originally obtained by extrapolating the norms already established for the Pintner Intermediate and Advanced Tests, and checking this extrapolation against several independent sources of information. Later, as a check on these extrapolated norms, another experimental testing program was conducted in the schools of Yonkers, New York. The Pintner-Cunningham Primary Test and the Pintner-Durost Elementary Test (which had been independently standardized in the interim) were administered to the entire second grade in Yonkers in a rotation-type experiment. Approximately 1700 pupils were included in this testing.

The distribution of Pintner-Cunningham total raw scores was plotted against the distribution of the Pintner-Durost median standard scores. Comparable percentiles were read off and lines of relation plotted. Having thus established the equivalence of Pintner-Cunningham raw scores and Pintner-Durost standard scores, it was possible to derive a new set of Pintner-Cunningham standard scores and age equivalents. These were found to agree with the norms already established. Standard score and mental age norms are shown in Table 4.

2. Derivation of IQ's

The IQ can be derived from the Pintner-Cunningham Primary Test either by the customary ratio method—i.e., dividing mental age by chronological age—or it can be obtained by the "deviation" method. Mental ages corresponding to given scores are shown in Table 4.

The deviation method is made possible in this case because (1) the distribution of standard scores is normal and (2) the standard deviation of standard scores remains approximately constant from one age level to another.

The derivation of IQ's by the deviation method is simplified considerably by the fact that the standard deviation of standard scores has been set equal to the best available estimates of the standard deviation of

[1] The Pintner-Cunningham norms for the original forms of the test have been transferred to the Manual for Interpreting the Pintner General Ability Tests for the benefit of those who still wish to use these norms.

TABLE 2

KEY AND SCORING SCHEDULE — *Form A*

Test	Section	Objects to be marked	Responses	Scoring Formula	Maximum Score
1	Part 1	scissors, thimble, needle, thread	4	$\frac{R - W}{2}$	$8\frac{1}{2}$
	Part 2	bird, hen, rooster, turkey, duck, owl	6		
	Part 3	balloon, airplane, bird, butterfly, bee, kite, bat	7		
2	Page 4	middle girl, left elephant, right house	3	Rights	6
	Page 5	middle flower, right line, left girl	3		
3	Page 6	coat and hat, table and chair, lock and key	3	Rights	6
	Page 7	hammer and nail, cup and saucer, moon and star	3		
4	Page 8	middle dress, left hat, right shoes, middle gloves	4	Rights	4
5	Part 1	girl, squirrel	2	$\frac{R - W}{2}$	15
	Part 2	pig, boy, basket	3		
	Part 3	doll, drum, girl dancing in middle, drumstick, boy at right	5		
	Part 4	elephant at top, Jack-in-box at left, package, drum, Christmas tree with candles in middle, doll at top, wagon, soldier at right	8		
	Part 5	three-step frame piece at upper left, same in middle, small frame piece at lower left, small frame piece below flower, bowl, larger bubble, boy at left, pipe, dog, flowerpot, plant at right, cap at bottom	12		
6	Page 12	boy's head, arm above large hand, leg at left with rounded top	3	Rights	11
	Page 13	leg at right, part of cane, stem, stick for flag	4		
	Page 14	line at left, right angle at bottom, horizontal line in middle, angle at left	4		
7	Page 15	each drawing counts one point	4	Rights	8
	Page 16	each drawing counts one point	4		
		If total score contains half a point, add another half point.		Total	59

TABLE 3

KEY AND SCORING SCHEDULE — *Form B*

Test	Section	Objects to be marked	Responses	Scoring Formula	Maximum Score
1	Part 1	umbrella, rubbers, raincoat, rain hat	4	$\frac{R - W}{2}$	$8\frac{1}{2}$
	Part 2	evergreen, tulip, small tree, large tree, cabbage, grass	6		
	Part 3	duck, sailboat, hydroplane, tug, alligator, canoe, life belt	7		
2	Page 4	middle boy, left camel, right wheelbarrow	3	Rights	6
	Page 5	middle vase, right leaves, left girl	3		
3	Page 6	knife and fork, bottle and glass, chair and table	3	Rights	6
	Page 7	hoe and spade, stove and kettle, letter and envelope	3		
4	Page 8	middle coat, left hat, right shoes, middle gloves	4	Rights	4
5	Part 1	boy, swan	2	$\frac{R - W}{2}$	15
	Part 2	donkey, girl, hat	3		
	Part 3	dog at top, girl, boy, kitten, saucer	5		
	Part 4	vase of flowers at upper left, velocipede, saucer, smaller jug at top, straight-back chair at top, auto at upper right, glass, doll at lower center	8		
	Part 5	frame piece at upper left, boy, stick, dog, quarter of circle at top center, sails below tree, frame piece in center, cap above kitten, duck, hull, quarter of circle at lower left, basket at right	12		
6	Page 12	doll's head, arm above large hand, leg at right with pointed top	3	Rights	11
	Page 13	rooster's claw, part of umbrella handle, stem, wagon handle	4		
	Page 14	lines at upper left, vertical line in center, open square at upper left, vertical line in center	4		
7	Page 15	each drawing counts one point	4	Rights	8
	Page 16	each drawing counts one point	4		
		If total score contains half a point, add another half point.		Total	59

TABLE 4

STANDARD SCORE AND MENTAL AGE CORRESPONDING TO TOTAL RAW SCORE * OF PINTNER-CUNNINGHAM PRIMARY TEST: FORMS A AND B

Raw Score	Stand. Score	Mental Age		Raw Score	Stand. Score	Mental Age		Raw Score	Stand. Score	Mental Age	
		Years and Months	Months			Years and Months	Months			Years and Months	Months
5	52	4–1	49	31	86	6–0	72	47	113	8–0	96
6	54	4–2	50	32	87	6–1	73		114	8–1	97
7	56	4–3	51		88	6–2	74		115	8–2	98
	57	4–4	52	33	89	6–3	75	48	116	8–3	99
8	58	4–5	53	34	90	6–3	75		117	8–4	100
9	59	4–5	53	35	91	6–4	76	49	118	8–5	101
					92	6–5	77				
10	61	4–6	54						119	8–6	102
11	62	4–7	55	36	93	6–6	78		120	8–7	103
12	63	4–7	55	37	94	6–7	79	50	121	8–8	104
13	65	4–8	56	38	96	6–8	80		122	8–9	105
14	66	4–9	57		97	6–9	81		122	8–10	106
15	67	4–10	58	39	98	6–10	82		123	8–11	107
16	68	4–11	59	40	99	6–11	83				
								51	124	9–0	108
17	70	5–0	60	41	101	7–0	84		125	9–1	109
18	71	5–1	61	42	102	7–1	85		125	9–2	110
19	72	5–2	62		103	7–2	86		126	9–3	111
20	73	5–2	62		104	7–3	87	52	127	9–4	112
21	74	5–3	63	43	105	7–4	88		128	9–5	113
22	75	5–4	64		106	7–5	89				
23	77	5–5	65						129	9–6	114
								53	130	9–7	115
24	78	5–6	66	44	107	7–6	90		130	9–8	116
25	79	5–7	67		108	7–7	91		131	9–9	117
26	80	5–7	67	45	109	7–8	92		131	9–10	118
27	81	5–8	68		110	7–9	93		132′	9–11	119
28	82	5–9	69	46	111	7–10	94				
29	84	5–10	70		112	7–11	95	54	133	10–0	120
30	85	5–11	71								

* In assigning standard scores or mental ages to raw scores, assign to each raw score the standard score or mental age directly opposite it.

IQ's — roughly, 16 points. To obtain the IQ by the deviation method, use must be made of Table 4. The steps are as follows:

1. Find the child's chronological age in the "Mental Age" column of Table 4 and opposite it read off the standard score which is the norm for this age.

2. Compute the deviation of the obtained standard score from the norm; i.e., find the difference between the two. If the obtained score is larger, this will be a plus deviation; if it is smaller, it will be a minus deviation.

3. If the deviation is plus — i.e., if the obtained standard score is greater than the norm — add the amount of the deviation to 100; the resulting value is the deviation IQ. If the deviation is minus — i.e., if the obtained score is less than the norm — subtract the amount of the deviation from 100 to find the deviation IQ.

3. USES OF THE STANDARD SCORE

Standard scores corresponding to total raw scores may be used wherever mental ages are customarily used. The standard score has several advantages over mental age, the most obvious being that the units of median standard score are equal at all parts of the scale, whereas mental age units vary; that is, a month or a year of mental age does not have the same meaning at all levels.

Perhaps the most frequent use made by administrators of intelligence tests at the kindergarten-primary level is in the grouping of children for instructional purposes. One important problem is the early discovery of those children entering Grade 1 whose mental development is not yet sufficient for successful work in the grade. If 6–0 is the mental age below which beginning reading should not be attempted, then all children earning a standard score of 86 or less should receive special attention. For doubtful cases the alternate form of the Pintner-Cunningham Test should be administered and the average of the two standard scores used as a basis for placement.

If more than one class is to be formed from a group of children, the administrator, by arranging the standard scores in order of magnitude, can divide the total group

into a given number of classes of equal ability range — e.g., by taking every third child if there are to be three classes; or he can form classes of descending order of ability by counting down from the top and truncating the distribution at desired intervals. If the latter is done and an effort is made to differentiate the curriculum for different ability levels, the median score of each class may be easily obtained by counting to the middle score. This score may then be referred to the table of norms for an intrinsically meaningful interpretation (mental age) and the curriculum set up to correspond to this mental level.

Where it is necessary to have a particularly accurate measure of an individual's intellectual ability, both forms of the Pintner-Cunningham Primary Test should be administered, with a short interval intervening between the tests. The average of the two standard scores should then be taken as the child's score.

In keeping cumulative record cards, the standard score for each child should be entered as of some standard time of the school year, preferably the time when the tests are usually given. If a child is absent when the test is given to the rest of his class, he may be retested later and his standard score estimated as of the general testing date. Since the standard score scale of the Pintner General Ability series is continuous, the use of the standard score on cumulative record cards will have added value if subsequent mental testing is done with other Pintner tests.[1] Moreover, the consistent use of tests from the same series will tend to stabilize the test results obtained from year to year.

[1] If cumulative records are kept in terms of standard scores, the median standard scores on the Pintner-Durost Elementary Test: Reading Content Scale, must first be translated into generalized standard scores. See Manual for Interpreting the Pintner General Ability Tests.

4. THE MENTAL AGE AND IQ

The IQ is a measure of relative brightness; it is a measure of one's intellectual stature in comparison with a group of similar individuals. The mental age is an index of the stage of an individual's mental development; it gives the age of the average child he most nearly approximates intellectually. When interpreting IQ's or mental ages, it must be borne in mind that any IQ or mental age is not independent of the instrument used to obtain it. IQ's or mental ages obtained with two different instruments may differ both in kind and degree.

The IQ as such is not as valuable a measure for determining school placement as is either the mental age or its corresponding standard score. An IQ simply tells the relative brightness of a child when compared with children *his own age*, but does not directly give the stage of his mental development. Therefore, a five-year-old child with an IQ of 120 cannot be expected to do the same intellectual tasks as a six-year-old child with the same IQ. However, a five-year-old child with a mental age 6–0 can do as well, other things being equal, as a six-year-old child with a mental age of 6–0. The IQ, then, is valuable in comparing *children of the same age* and in estimating their probable rate of mental development, but the mental age and corresponding standard score can best answer the question, Is a child placed where he can do optimum work? A class of children with equal IQ's may not be homogeneous in mental ability, but a class of children with equal mental ages or standard scores will be much more nearly so.

DETROIT WORD RECOGNITION TEST

By Eliza F. Oglesby, A.M.
Formerly Assistant Supervisor of Reading
Detroit, Michigan

MANUAL OF DIRECTIONS

CONTENTS

I. The Need for a Group Test in Reading for the First Grade

During the past three or four years the need for a simple group reading test for the first grade has become more and more urgent. A number of reading tests have been published, but few have been suitable for use below the second grade. Yet it is in the first grade that so many radical changes are being made in teaching procedure.

Two forces, the increasing belief in the efficacy of the project method and the acceptance of the fact that provision must be made for individual differences, are rapidly modifying the classroom organization, materials, and methods. Teachers are eager to know how these changes are affecting results in reading. How can this progress be evaluated objectively unless some tool is available to measure it?

It is in the first grade that the initial steps are being taken in mastering that most fundamental of all school achievements, the ability to read. Yet how can a pupil's progress in these first stages of reading be determined scientifically without some measuring instrument?

Furthermore, several schools which have adopted the plan of classifying pupils on the basis of intelligence plus achievement in school subjects,

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have hesitated to begin their classification below the second grade because of the scarcity of reading tests for the younger pupils.

All these facts show the need for a simple group test in reading for first grade. It was with the hope of meeting this need that the Detroit Word Recognition Test was constructed.

II. Standardization of the Test[1]

The test consists of a series of forty words and phrases, with pictures to correspond. The pupils read a word or phrase, find the picture to match it, and draw a line from the word to the picture. On the front page of the test there is a practice exercise by means of which the children learn easily to take the test. The pictures and the marking activity make a strong appeal to little children. They take the test just as if it were a new game and usually ask if they may have the booklet to take home. This attitude is one which is rather difficult to get toward a test for such young children. It makes for greater reliability in results because interested children usually do their best.

The material for the test has been selected with very great care. Two sources were utilized, Dr. Thorndike's *Word Book* and a study of the vocabularies of ten widely used first readers. The words which occurred approximately fifty times or more in the first-reader list were checked with the first five hundred in Dr. Thorndike's list. Those common to both lists were selected. This insures, first, that all the words in the test are words that occur frequently in the children's books, and second, that no words are included that are not essential to the reading vocabulary of the elementary school pupil.

After the completion of this list, a few words such as " alone," " was," " be," etc., had to be eliminated because they could not be pictured or used in a descriptive phrase without ambiguity. The remaining words were classified as nouns, verbs, prepositions, and modifiers, and arranged according to their frequencies in the first-reader list. Each of these groups was divided into three sections. Section one, of each group, consisted of the words having the highest frequencies; section two, of those occurring less frequently; and section three, of the least common words.

The next step was to construct ten forms of the test which would be equivalent in difficulty in so far as frequency of occurrence determines difficulty. The procedure adopted was to assign arbitrarily, to each test form, a certain number of words from each section. For example, in every form of the test, fourteen words are used from section one of the noun list, eight from section two, and four from section three. In like manner, the verbs, prepositions, and modifiers were assigned. In every case more words were selected from the first section (words having highest frequencies) than from the other two sections. Thus each form contains an equal number of easy words, such as " girl," " boy," " to," etc., which are common to every other

[1] See also "A First Grade Reading Test," by Eliza F. Oglesby, in the *Journal of Educational Research* for June, 1924.

form. The remaining words are not identical in the ten forms but are of approximately equal difficulty because they were selected from sections of words having the same frequencies. This plan makes it possible to construct a variety of phrases without changing the difficulty to any appreciable extent. For example, the word " milk " is used alone and in such phrases as " a milk man," " a can of milk," " a girl drinking milk," etc. Such variety prevents memorization of any form of the test.

The number of words used in the test and the variety of phrases obtained by using them in different combinations is evident in the following table:

TABLE 1

Number of words and phrases per form	40
Total number of words per form	120
Number of different words per form	63
Total number of different words in all forms	111
Total number of different word and phrase groups	271

III. DIRECTIONS FOR ADMINISTERING

Prepare a test blank for each pupil by writing his name on the first page and entering any further data that are desired.

Provide each pupil with a crayon (preferably black).

Say to the pupils: " **Here are some little picture books containing some of the words you have been learning. There is a book for each one of you. Leave your book on your desk just as I place it and do not look inside until I tell you to do so. We are going to play a game.**"

Pass the tests, face up. If the pupils cannot write their names readily, the instructor should fill them in beforehand. If they can write, say: " **Write your name on the top line.**" (Illustrate.)

Then say: " **Look at the first word. What is it?** " (Call on one child to tell. Do not have pupils answer in concert.) " **Every one find the picture of the chair. Put your finger on it. Now watch while I draw a line from the word to the picture.**" (Illustrate so that every one can see.) " **Now you may all draw a line from the word ' chair ' to the picture of the chair.**" (See that every one has done this correctly.) Then say: " **What is the next word? Find the picture of the baby. Draw a line from the word to the picture. Now draw a line from the next word to the right picture. Then the next and the next and the next. First read the word, then find the picture, then draw the line.**" Give any help necessary so that all pupils draw all six lines.

When all have finished, say: " **There are more words and pictures inside the book for you to mark all by yourselves. You are to mark every one you know. If you do not know a word, leave it and go right on to the next word; when you finish one page, go right on to the next. Look up here at my book and see how many pages there are for you to mark.**" (Children count " One, two, three.")

" **Let me see how many understand just what to do. If you do not know**

a word, what will you do?" (Leave it and go right on.) "**When you finish one page, what do you do?**" (Go right on to the next.)

"**Ready! Turn to the next page and begin!**" See that all begin in the right place. Allow exactly 4 minutes. Sit quietly in front of the room and give no additional help. At the end of four minutes say, "**Stop! Close books! The game is over. You did very well.**"

IV. Directions for Scoring and Recording

Put a check mark after each word or phrase that is correctly joined to *one* picture. If lines are drawn from one word to two pictures or from two words to one picture, count both lines as wrong responses, even if one of the lines is drawn correctly. If a line is drawn to a correct portion of another picture, as from *door* (No. 5 of Form A) to the door in the picture of the house, count the item as right.

The score is the total number of correct responses. Count these and write the score in the space provided on the first page of the test.

There is furnished in each package of tests a Class Record on which the scores of 50 pupils may be recorded. If these records are preserved, the scores of a second test may be entered on the same sheets. The names of the pupils may be entered in alphabetical order, and after each pupil's name his age in years and months; and his score in both the first and second tests may be entered. The column headed "Classification" is provided so that an entry may be made after each pupil's score designating the class to which he is assigned or for any similar purpose.

V. Norms

In Table 2 are given the median scores of Grades 1B to 3A at the beginning and at the end of the term. In Table 3 are given the medians for each of three intelligence groups. Upper quartile (Q_3) and lower quartile (Q_1) scores are also given. Table 3 is read as follows:

The lower quartile score of the X group (bright pupils) of Grade 1B at the beginning of the term was 2 points (75 per cent of this group made scores of 2 or more); the median score of this group was 4 points, and the upper quartile score 6 points (25 per cent made scores of 6 or more). The lower quartile score of this group at the end of the term was 11 points; the median was 17 points; etc.

Table 2

Grade	Median Score at Beginning of Term	Median Score at End of Term
1B	3	12
1A	10	20
2B	18	28
2A	25	34
3B	30	37
3A	36	37

TABLE 3

INTELLIGENCE GROUP	GRADE	BEGINNING OF TERM			END OF TERM		
		Q_1	Mdn	Q_3	Q_1	Mdn	Q_3
X (Bright)	1B	2	3	6	11	17	25
	1A	7	15	22	23	29	35
	2B	18	25	32	29	34	38
	2A	26	32	37	32	37	39
	3B	29	35	38	36	38	39
	3A	30	36	39	37	38	40
Y (Normal)	1B	1	3	4	7	12	19
	1A	6	10	14	14	20	27
	2B	14	18	25	21	28	34
	2A	19	24	30	27	33	38
	3B	24	30	36	32	37	39
	3A	26	33	36	32	37	39
Z (Dull)	1B	1	2	3	4	7	11
	1A	5	7	11	9	14	20
	2B	8	12	17	13	20	27
	2A	13	18	24	23	29	35
	3B	18	25	31	26	33	38
	3A	25	32	36	28	34	38

VI. DIRECTIONS FOR INTERPRETING AND USING RESULTS

A. To aid in grouping pupils. The modern school aims to provide for individual differences by classifying pupils into homogeneous groups so that they may be able to work together effectively. Three important bases for classification are used: first, mental tests; second, educational tests; and third, the teacher's judgment based on an intimate knowledge of the pupil's health, energy, aptitude, and social development.

The Detroit Word Recognition Test may be used profitably in conjunction with one or more mental tests, as a basis for classifying first- and second-grade pupils for work in reading. If the test is used as an inventory test at the beginning of a semester, it will be possible for a teacher to classify her pupils into three or more groups which may progress at different rates according to the children's abilities.

Some intelligence examinations contain tests which measure abilities closely akin to those used in reading. Often a study of the child's responses to these tests is worth while, as well as a consideration of his total score. The tentative norms based on the achievement of X, Y, and Z groups in Detroit schools will aid in the selection of pupils for these grades.

The test will serve to reveal, also, which of the entering first-grade pupils have made a beginning at home or in kindergarten in learning to read. These pupils may be grouped with a rapidly moving section and need not be held back with pupils who have had no experience in interpreting printed symbols.

Whether or not reading should be taught in the kindergarten is a problem which is engaging the attention of many primary experts at the present

time. One way to answer this question is to experiment with a small group of children and see whether or not the results are worth the effort. The test will be of value in such an experiment to measure the gain made in word recognition.

The advantage of being able to take an inventory of first- and second-grade pupils' progress in word recognition at the very beginning of the semester is great. Heretofore, many teachers have spent from three to six weeks in discovering through incidental means which pupils needed drill on their fundamental first-grade vocabulary and which were ready to progress to a higher stage in the reading process. By means of an initial test, the teacher may have this information at the beginning of the semester and may use it immediately to plan work that will meet the needs of each group.

NOTE. No classification of pupils should be fixed and inflexible. The most carefully made groupings will need to be modified from time to time to take care of changes in the pupils' rates of development.

B. To measure the effect of new reading methods or materials. Many supervisors and teachers are experimenting with new methods of teaching reading and need some means of evaluating their results scientifically. The Detroit Word Recognition Test provides one instrument for measuring progress in one of the elementary abilities involved in reading.

One of the simplest ways in which to conduct an experiment to measure a new reading method is to use the "equivalent groups method." The essential element in this plan is that two groups of pupils be selected who are comparable in every factor which affects reading ability. One group uses the experimental method, and the other uses the conventional method with which the former is to be compared. These two groups are called the experimental and the control groups. Both groups are measured at the beginning and at the close of the experiment. A comparison of the improvement made by each group will serve to reveal which method is more effective.

C. To measure growth in word recognition. It is often advisable to measure pupils several times during an experiment in order that their rates of growth during successive intervals may be determined. If alternative forms are used, pupils may be tested monthly without danger of the results being appreciably invalidated because of their memorizing the test.

The test might be used to study differences in the growth curves in word recognition of pupils of high and of low intelligence; of pupils of foreign birth versus those of American parentage; of pupils of normal health versus those in fresh-air rooms; of pupils having a certain type of supervision versus those not having it; etc.

D. To stimulate pupils. Many teachers of special classes have found that their pupils were stimulated to greater effort in reading after making some attractive graph of their scores on this test. The fact that the test yields a single score makes it easy for the children to do this. The type of graph in which each child competes with his own past record has been most successful. A class graph, of the pictorial type, upon which the child colors his new record, makes a decided appeal also.

E. To diagnose difficulties of poor readers in the third and fourth grades. Many pupils have special disabilities in reading on account of which they reach the third or fourth grade without gaining control over the mechanics of reading. The Detroit Word Recognition Test may be used as an aid in diagnosing the difficulties of poor readers. If a third- or fourth-grade pupil earns a low score on this test, it is almost certain that he is hampered by defective vision or is having difficulty in making permanent associations between ideas and printed symbols.

Remedial work for such cases is described in Dr. William S. Gray's "Remedial Cases in Reading: Their Diagnosis and Treatment"; University of Chicago, 1922.

F. The Percentile Graph. It will be helpful in interpreting the scores of a class to draw a percentile curve to represent the distribution of scores on a percentile graph.[1] A percentile curve shows at a glance the median score of the class, the percentile rank of any pupil among the members of the class, etc. Curves representing the scores of two or more classes may be drawn on the same graph and conveniently compared.

VII. Statistical Measures of the Test

A. Validity. One responsibility which every test maker must assume is that of determining to what extent his test is valid; that is, to what degree it measures what it is supposed to measure. The specific problem in this case was to discover whether or not the test yielded a valid measure of the pupil's ability to recognize common words. One way of determining validity is by correlation with some valid criteria outside the test itself. In this test it was also necessary to study the effect of the pictures used.

In order to determine whether or not the pictures used in the test were adequate, representative B1, A1, B2, and A2 pupils were tested on the pictures alone, without any reading being involved. First, they were asked to tell what each picture represented. For example, the examiner would say, "What is this?" pointing to the picture of the boy. In every case in which the child's response differed from the words used in the test, a record was made of the exact words which he said. A tabulation was made of the different responses for each picture, and all pictures which did not represent clearly what they were designed to represent were redrawn.

Some of the pictures, which seemed very clear from an adult point of view, were misleading to the children. For example, in Form B the phrase "a boy walking down a hill" is used. Several children insisted that the illustration was a picture of a boy going fishing. After careful study and a good deal of questioning, it was discovered finally that the sky line in the picture was drawn through the boy's hand. The children interpreted this line as a fishing rod. The picture was redrawn, after which there was no more difficulty.

The pupils were asked also to find the pictures when the examiner read orally the corresponding word or phrase group. Since this response is

[1] The Universal Percentile Graph is suitable for this purpose. Published by World Book Company, Yonkers-on-Hudson, New York.

exactly what is required in the test with the reading difficulty removed, it was very interesting to find that out of 1200 responses, only 8 were incorrect. 84 per cent of the pupils tested in this way found every item correctly; 6 per cent found 39 out of 40 correctly; 10 per cent found 38 out of 40; none found less than 38. From these two studies it is believed that the pictures are adequate in the final forms of the test and that variations due to misinterpretation of the pictures will be practically negligible.

As an additional measure of the validity of the test, the correlation was found between scores and the teachers' estimates of pupils' ability in word recognition. This correlation was found to be .74, which shows that the test measures very much the same ability that teachers have in mind as ability in word recognition.

From these data it is evident that the test is a valid test of word recognition.

As a matter of interest the correlation was found between scores in the Detroit Word Recognition Test and scores in the Haggerty Reading Examination, Sigma 1, in the case of 65 pupils in Grades 1 and 2. The coefficient was .83 ± .04.

B. Reliability. Reliability means the amount of agreement between results secured from two or more applications of a test to the same pupils. One measure of reliability is the coefficient of correlation between two scores of the same pupils in two forms of the test.

This measure of reliability has been found in two ways: first by finding the correlation between two complete forms of the test, and second by finding the correlation between the two halves of a single test, letting the odd-numbered items be one half and the even-numbered items the other half. In the first case the coefficients were .86, .77, .72, and .52, for Grades 1B, 1A, 2B, and 2A, respectively. For these grades the coefficients of correlation between two halves of the same test were, respectively, .95, .93, .84, and .96. It will be seen that these coefficients are much higher than the first, even though half of a test is necessarily less reliable than the whole test. Therefore, the lack of agreement between scores in the two administrations of the whole test which were given a day apart cannot be attributed to unreliability of the test and must be due, therefore, to the fact that little children vary greatly from day to day in their ability to concentrate, in the quality of their attention, interest, etc.

C. Equality of forms. Investigation showed all forms to be exactly equal in difficulty.

D. Practice effect. The practice effect when the second test is given one day after the first is estimated as follows:

At the 1B level about 2 words
At the 1A level about 3 words
At the 2B level about 4 words
At the 2A level about 6 words

DETROIT WORD RECOGNITION TEST

By Eliza F. Oglesby, A.M.

Formerly Assistant Supervisor of Reading
Detroit, Michigan

EXAMINATION: FORM B

For Primary Grades

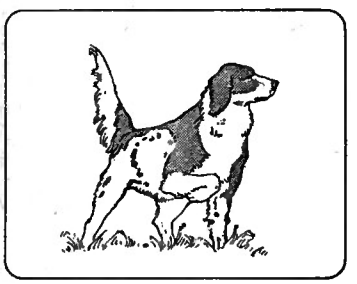
Name ..... Score .....
(First name, initial, and last name)

Age last birthday ..... years ..... months

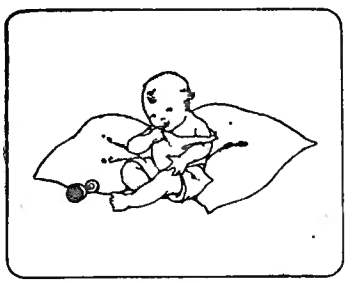
Grade ..... Teacher .....

School .....

City ..... Date .....



chair



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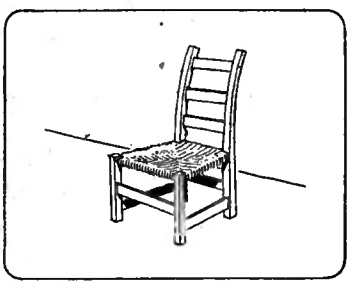
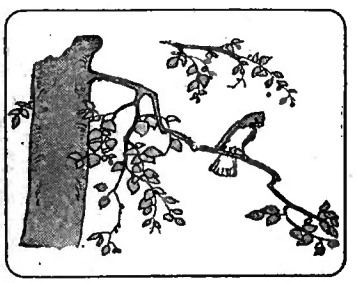
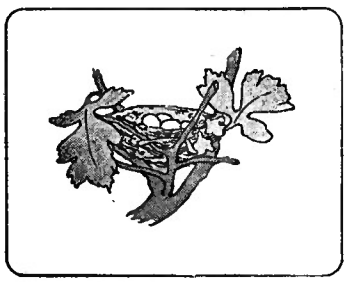


dog

nest



a girl running

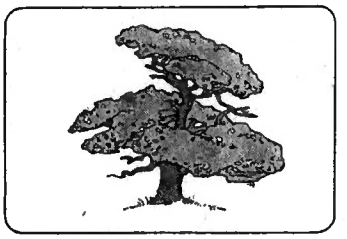


a bird in a tree

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago

tree 1

boy 2



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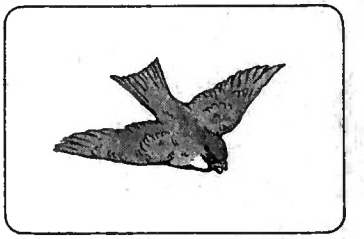

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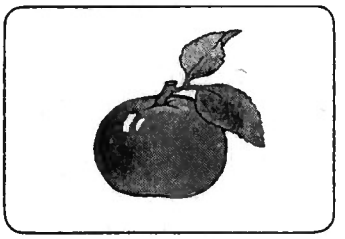

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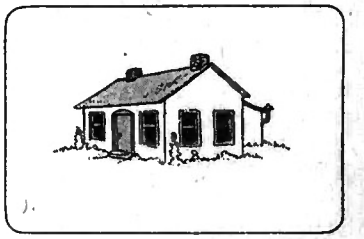
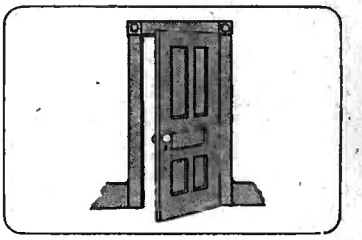
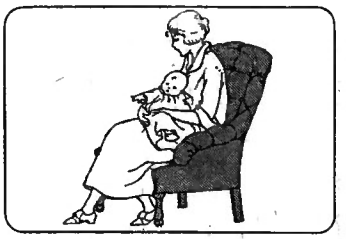


king 6

bird 7



house 8



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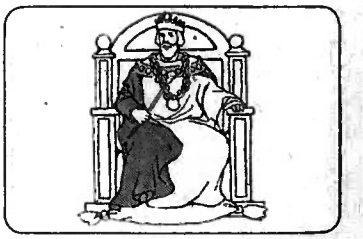

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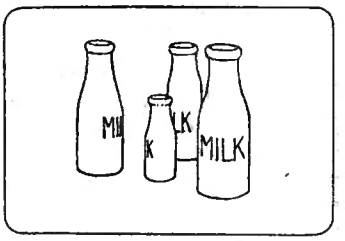
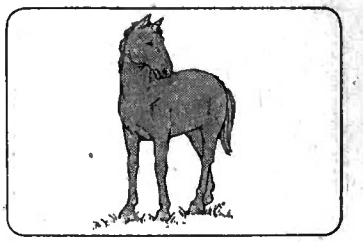


children 11



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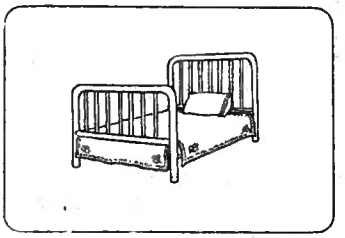
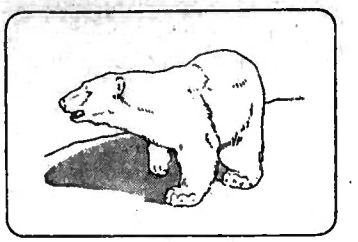


milk 13

horse 14

some boys and girls 15

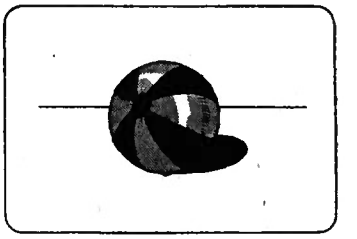


a black bear 16

a white bear 17

one big ball 18

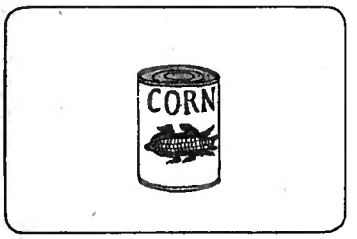
two little balls 19



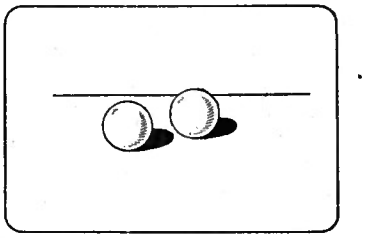
a can of corn 20

a boy eating corn 21

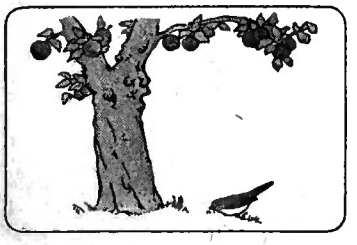
a milk man 22



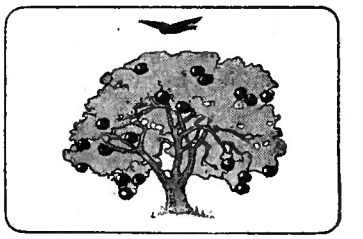
a fire man 23



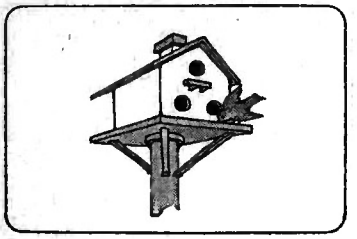
a boy making a fire 24



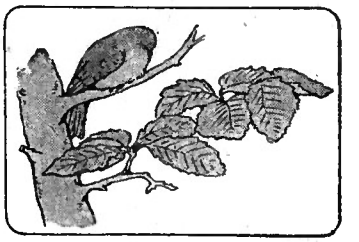
a house for a bird 25



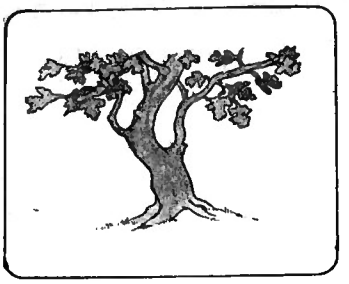
a bird sleeping in a tree 26



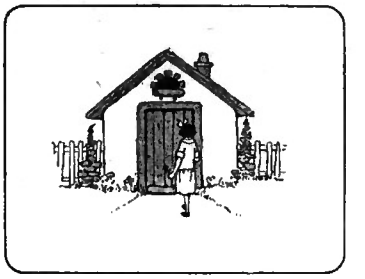
a bird flying over an apple tree 27



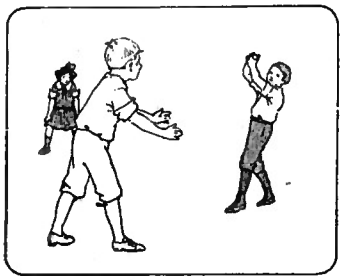
a bird under an apple tree 28



a girl going into a house 29

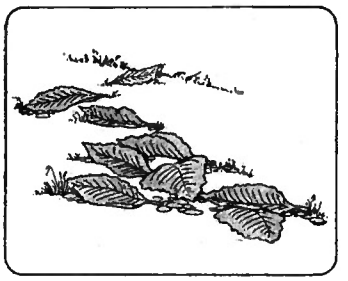


a girl buying some bread 30



some leaves on a tree 31

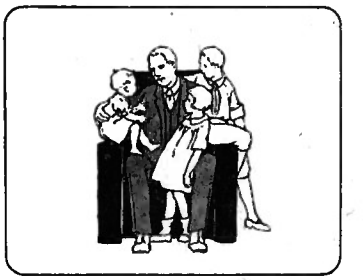
some leaves on the ground 32



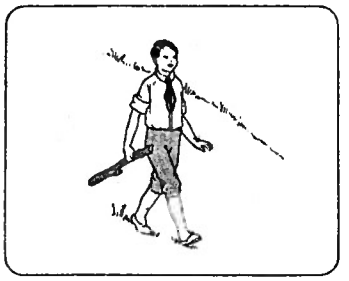
three children playing ball 33

a father with his three children 34

a girl telling a boy to come 35

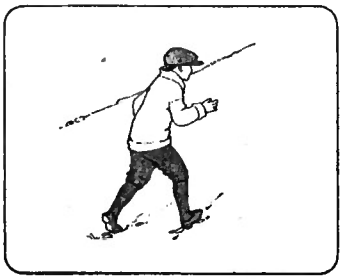


a boy walking in the rain 36



a boy walking up a hill 37

a boy walking down a hill 38



a mother singing to her little girl 39

a mother giving her little girl some water 40

DETROIT WORD RECOGNITION TEST

By Eliza F. Oglesby, A.M.
Formerly Assistant Supervisor of Reading
Detroit, Michigan

EXAMINATION: FORM C

For Primary Grades

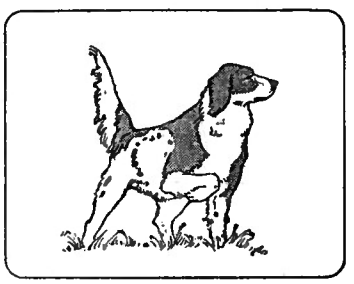
Name ..... Score .....
(First name, initial, and last name)

Age last birthday ..... years ..... months

Grade ..... Teacher .....

School .....

City ..... Date .....



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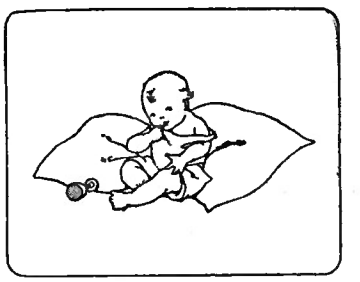
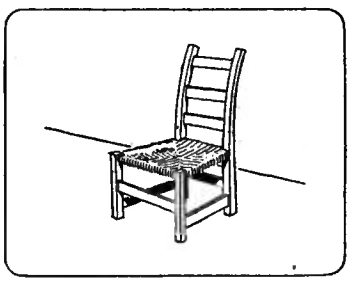
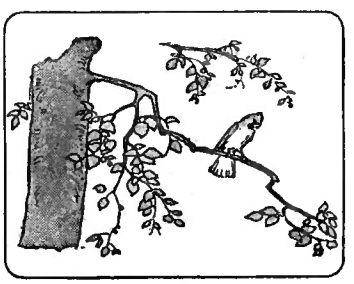


baby

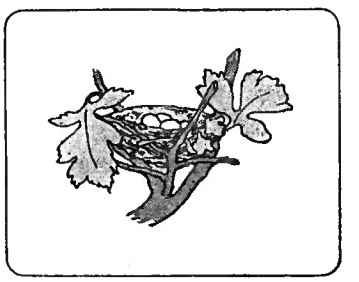


dog

nest



a girl running

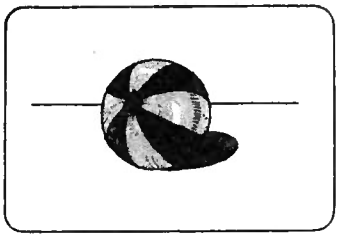


a bird in a tree

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago

ODWRT : E : C–2

PRINTED IN U.S.A.



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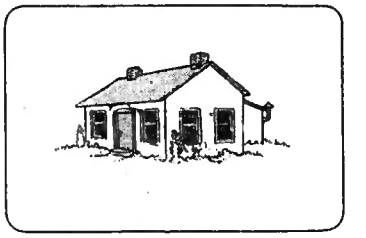
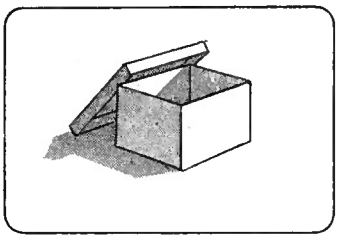
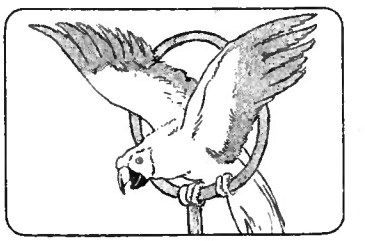
ball 2

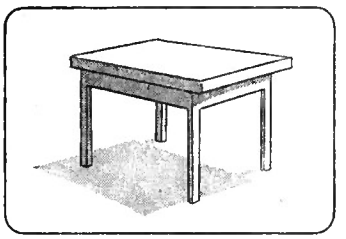




house 3

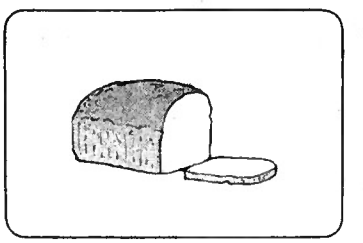
bread 4





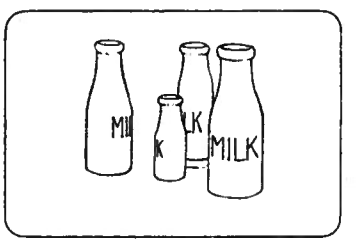
sun 5

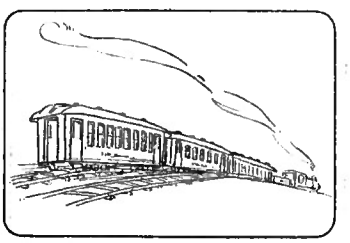
train 6



box 7

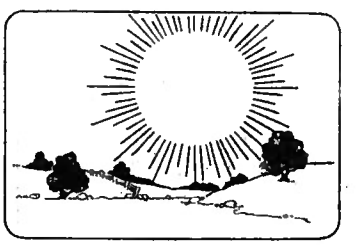
table 8

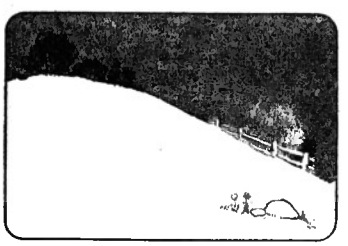




milk 9

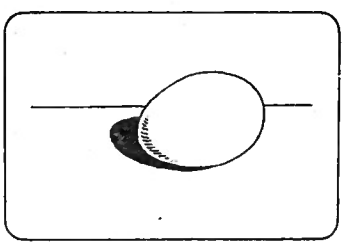
girl 10

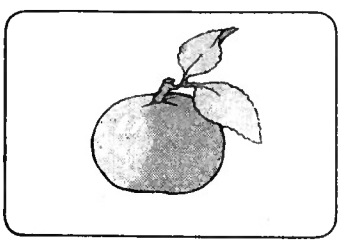




apple 11

man 12

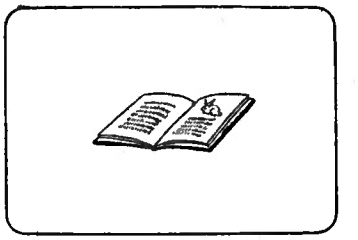




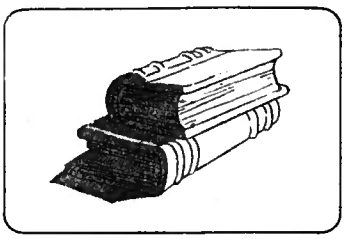
egg 13

hill 14

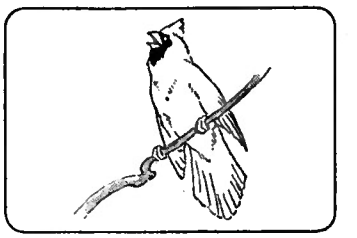
two big books 15



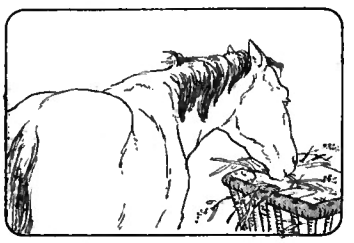
one small book 16



a mother and a father 17

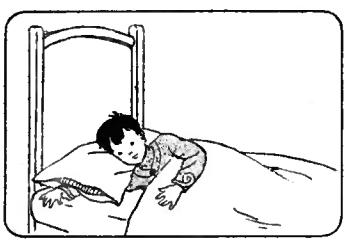


a horse eating 18

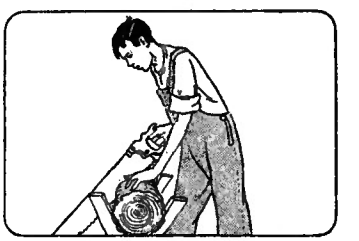


a bird flying over a tree 19

a boy in the top of a tree 20



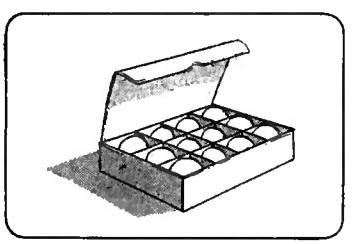
a bird singing 21



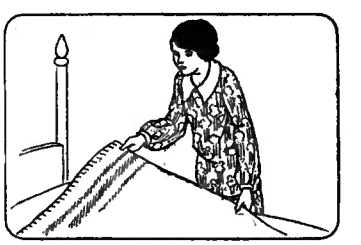
a boy carrying water 22

a boy in bed 23

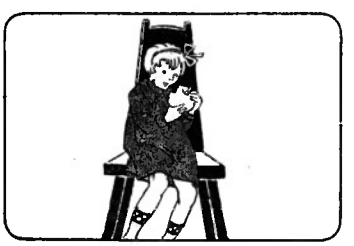
a man sawing wood 24



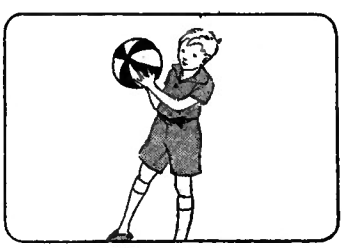
a boy with his ball 25



a girl eating an apple 26

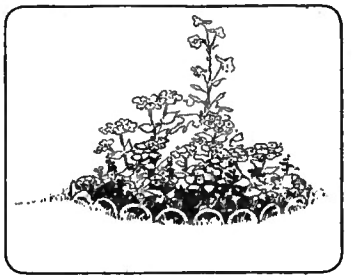


a box of eggs 27



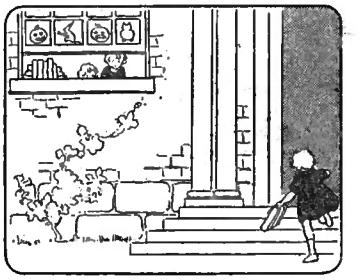
a mother making a bed 28

a boy
reading his book
29



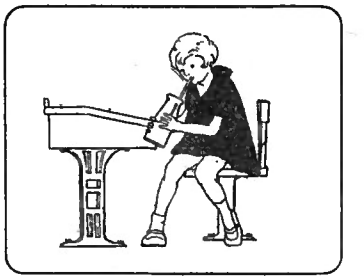
a bed of flowers
30

some children
looking
for flowers
31

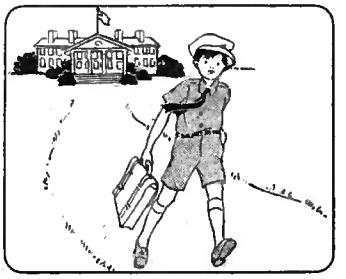


a girl
drinking milk
32

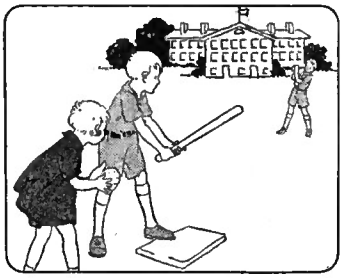
a girl running
into the school
33



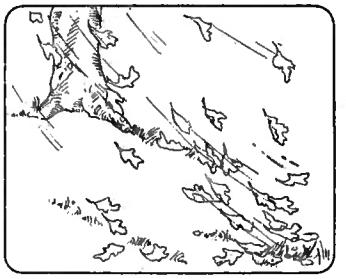
a boy coming
from school
34



some children
running
around a tree
35

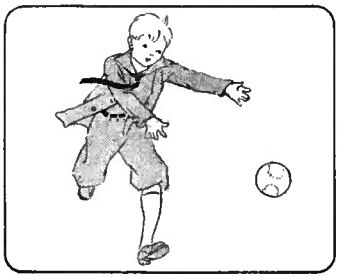


a boy running
after his ball
36

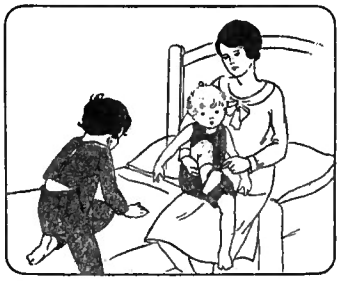


a mother putting
her children
to bed
37

a boy putting
some apples
on the table
38



some children
playing ball
at school
39



the wind blowing
the leaves
40

DETROIT WORD RECOGNITION TEST

By ELIZA F. OGLESBY, A.M.
Formerly Assistant Supervisor of Reading
Detroit, Michigan

EXAMINATION: FORM D

For Primary Grades

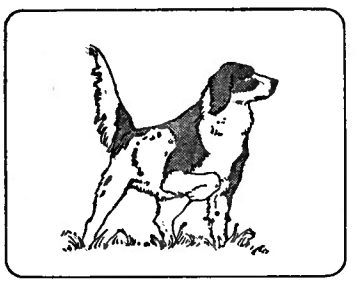
Name .....Score.....
(First name, initial, and last name)

Age last birthday .....years.....months

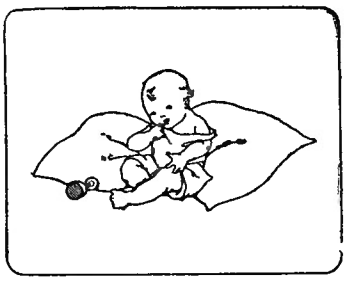
Grade .....Teacher.....

School .....

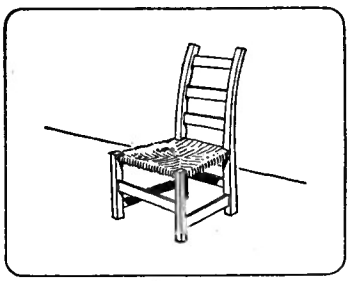
City .....Date .....



chair

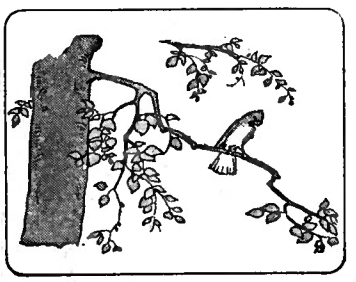


baby

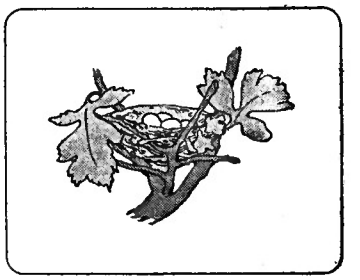


dog

nest

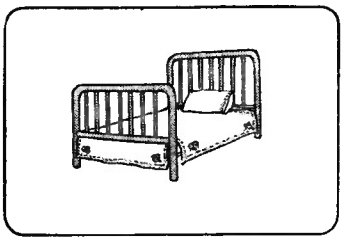


a girl running



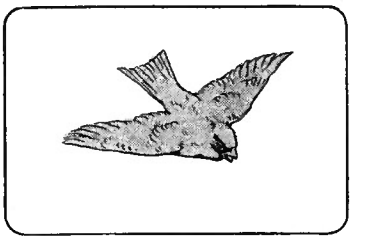
a bird in a tree

Published by World Book Company, Yonkers-on-Hudson, New York, and 2126 Prairie Avenue, Chicago



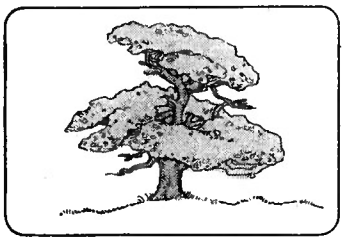
tree

1



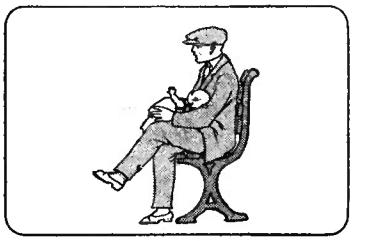
bird

2



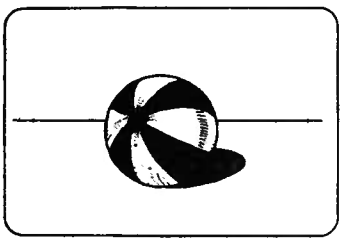
bed

3



ball

4

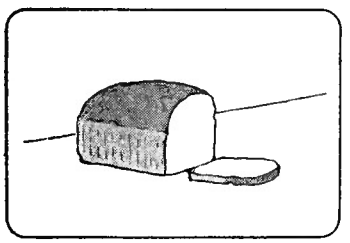


boy

5

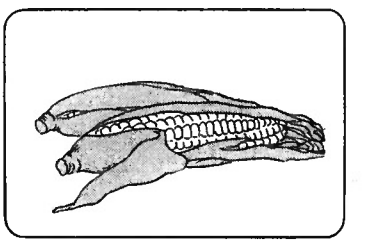
book

6



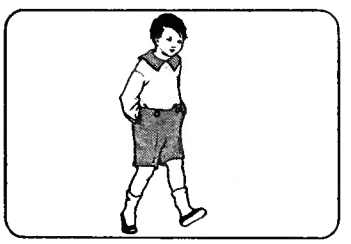
father

7



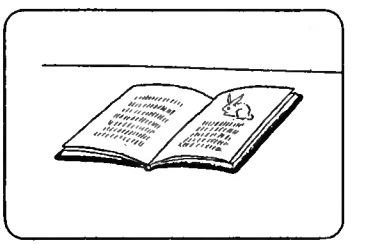
leaves

8



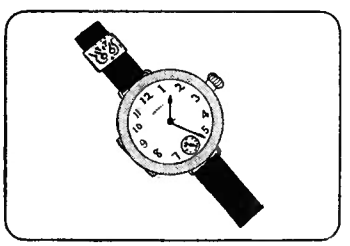
bread

9



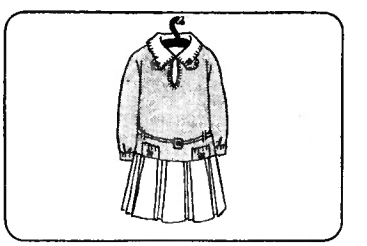
corn

10



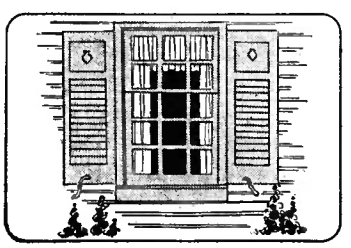
mother

11



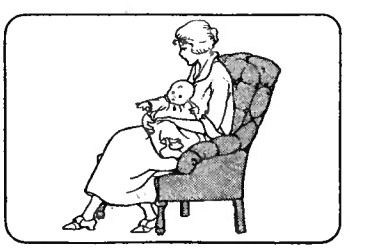
window

12



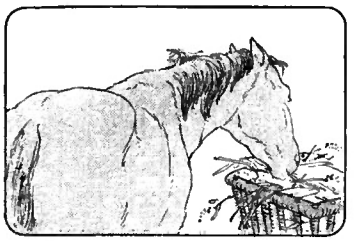
watch

13



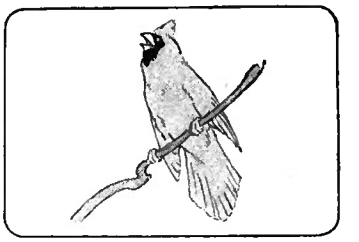
dress

14



a boy and a girl

15

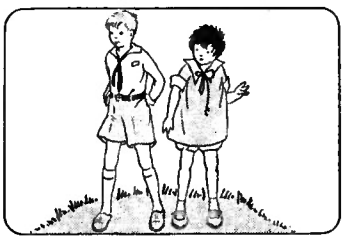


a horse eating

16

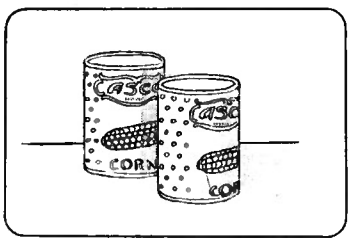
a bird singing

17



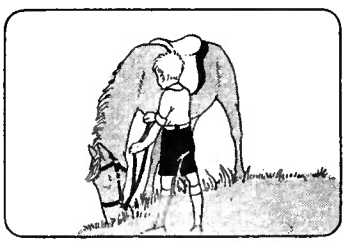
a boy
with his horse

18



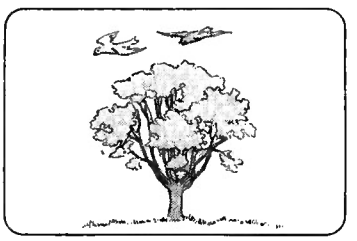
a long white dress

19



a mother
making a dress

20

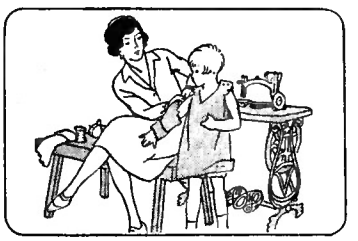


a girl eating corn

21

two cans of corn

22

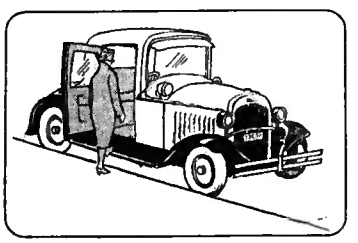


a boy in a tree

23

two birds flying
over a tree

24

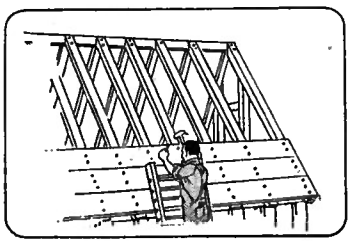


a man
making a house

25

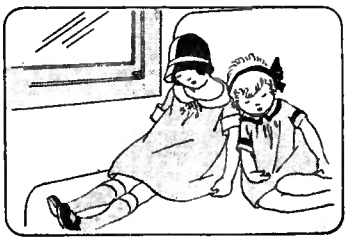
two girls
sleeping

26



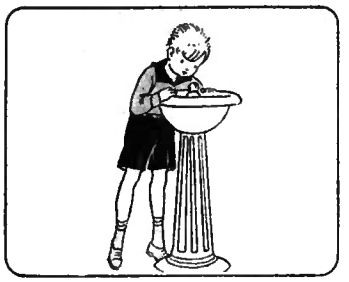
the wind blowing

27



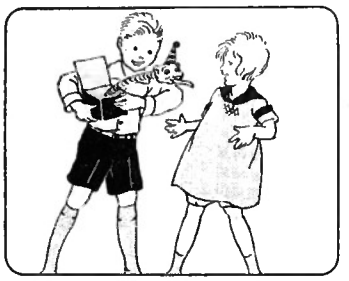
mother
going for a ride

28



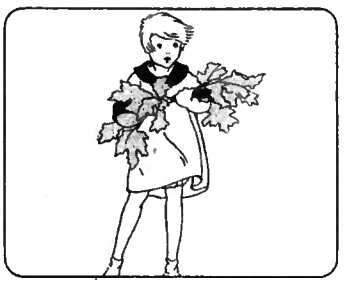
two happy children 29

a girl putting on her dress 30

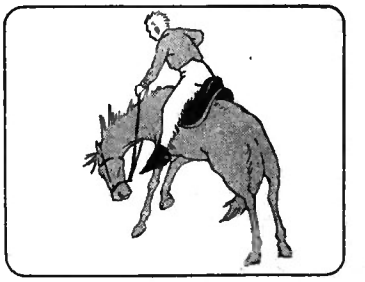


a boy taking a drink of water 31

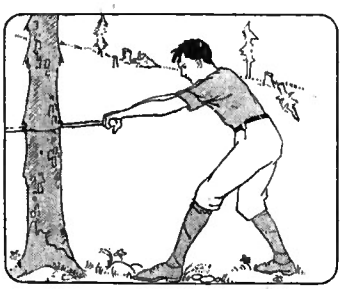
a man on a horse 32



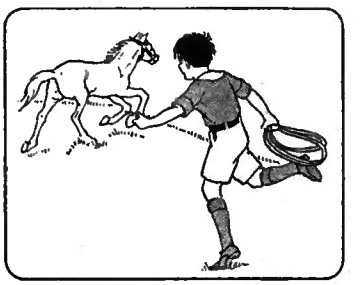
a man sitting under a tree 33



a girl with some pretty leaves in her hand 34

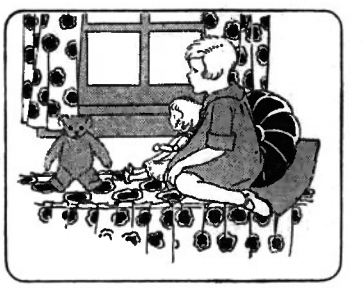


a man sawing down trees 35

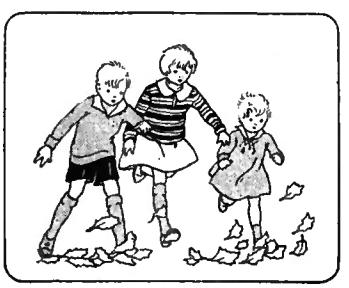


some children running in the leaves 36

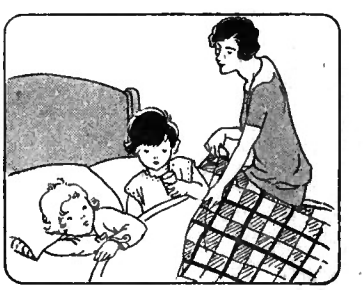
a mother putting her little girls to bed 37



a girl sitting at the window 38



a boy running after a horse 39



a man in the rain 40

PINTNER GENERAL ABILITY TESTS: VERBAL SERIES

Pintner-Cunningham Primary Test: Form B

Chron. Age	
Mental Age	
IQ	

By RUDOLF PINTNER, PH.D.
Professor of Educational Psychology, Teachers College, Columbia University

BESS V. CUNNINGHAM, PH.D.
Professor of Education, University of Toledo

and WALTER N. DUROST, PH.D.
Formerly Research Associate, Institute of School Experimentation
Teachers College, Columbia University

Prim.
B
(Verbal)

For Kindergarten and First and Second Grades

Name .....

Age ..... years ..... months. Date of birth .....

Grade ..... Teacher .....

Date of test ..... 19 .... Examiner .....

School .....

City ..... State .....

TEST	SCORE
1	
2	
3	
4	
5	
6	
7	
Total	

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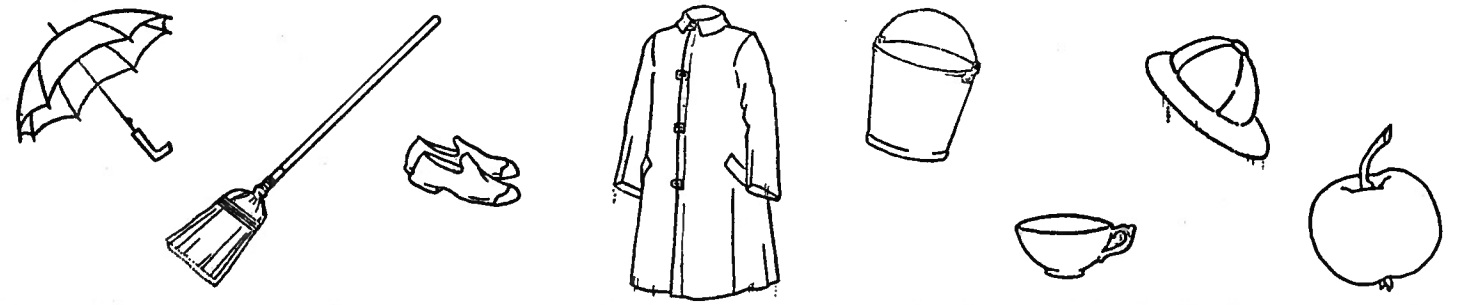
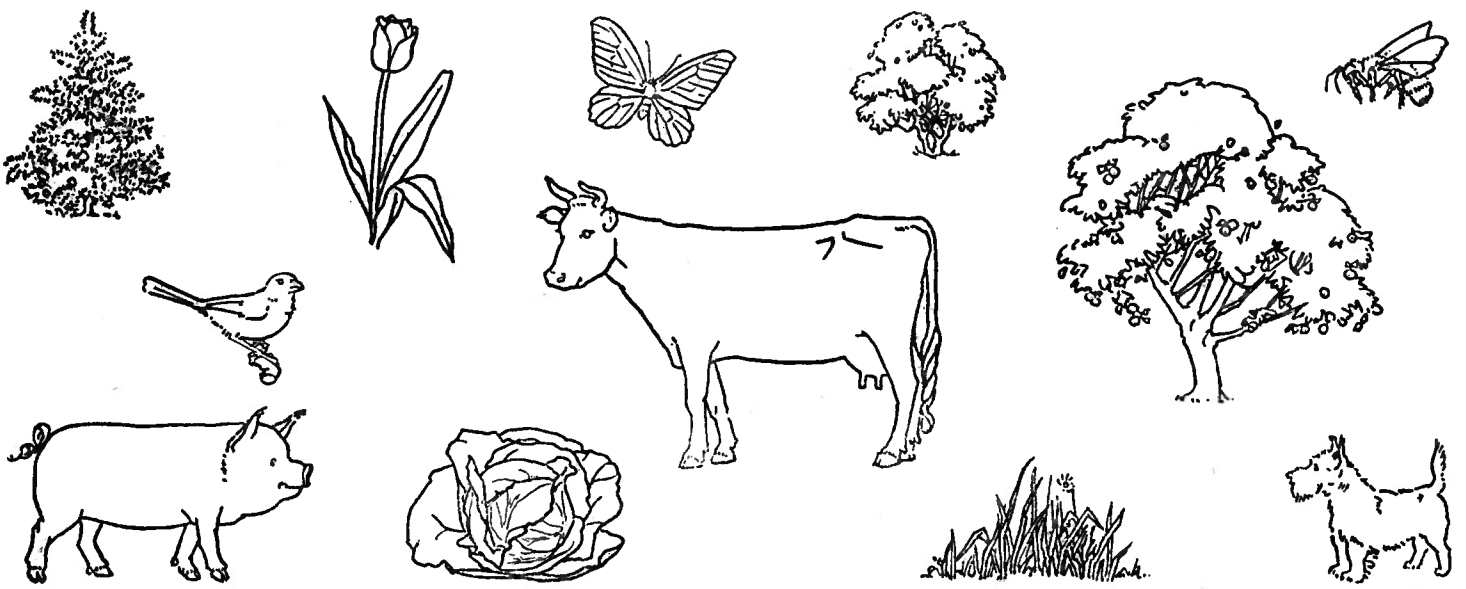
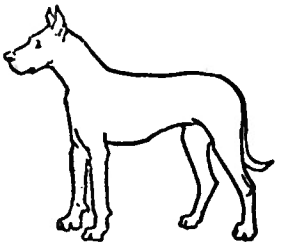
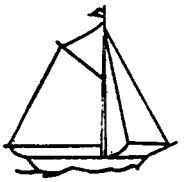
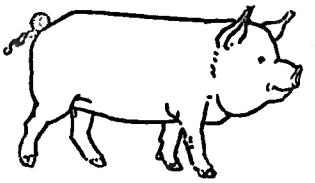
TEST 1

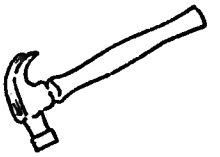


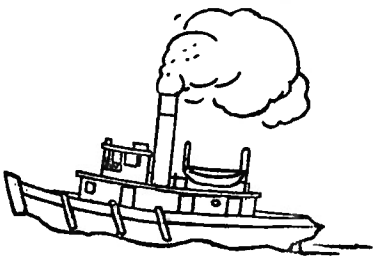


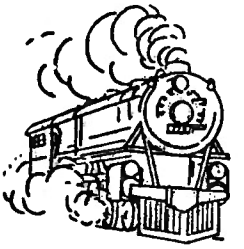


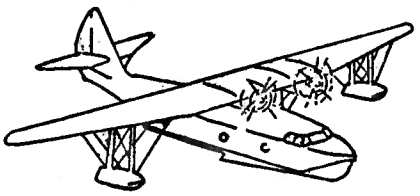


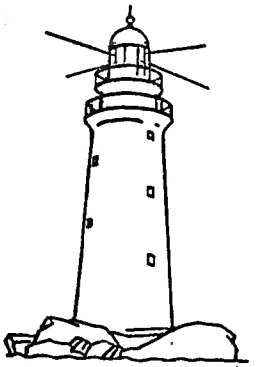


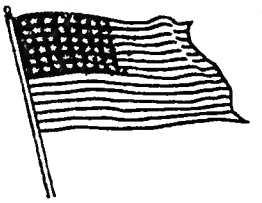


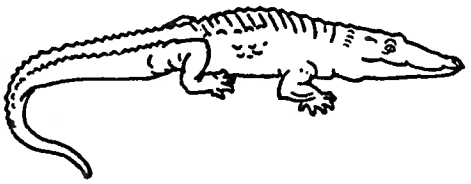


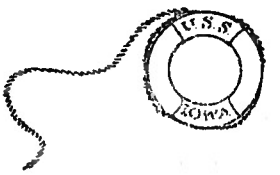












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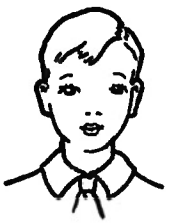
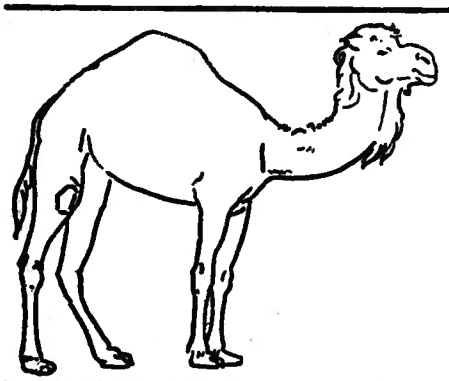
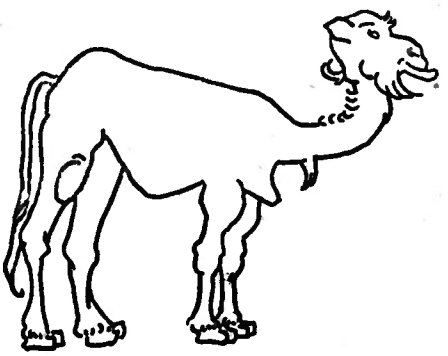
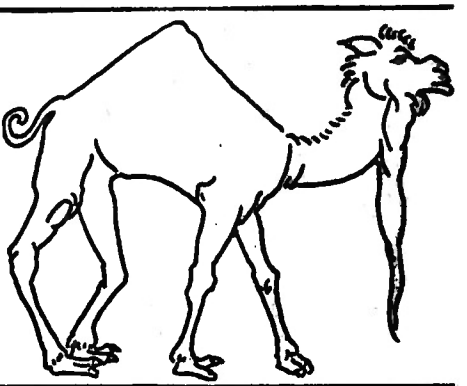
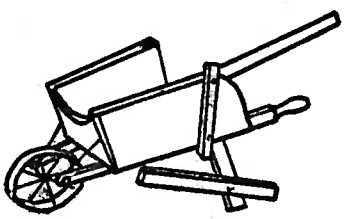
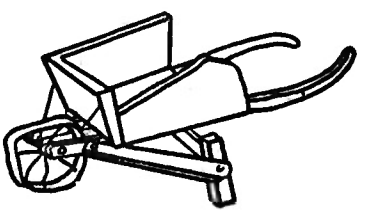
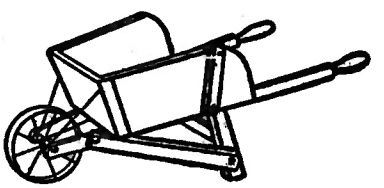
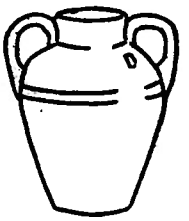
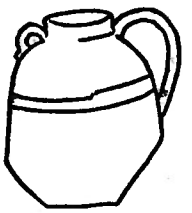
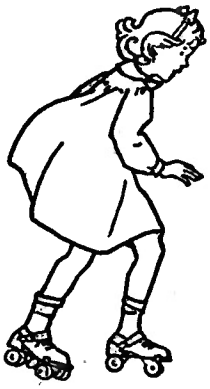


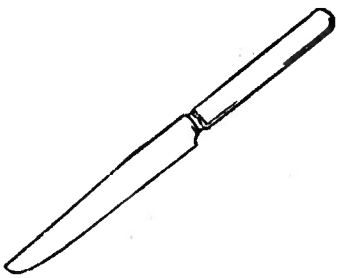
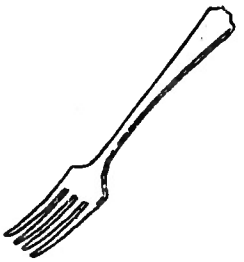





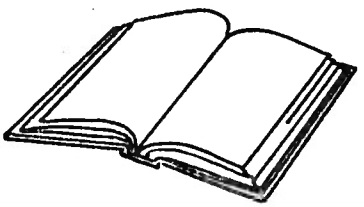


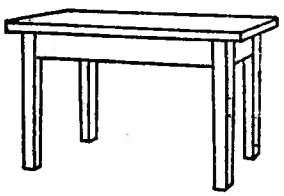
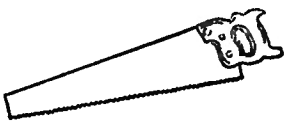
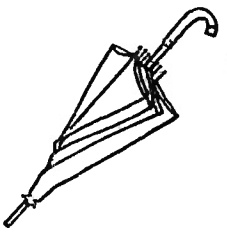
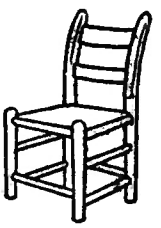


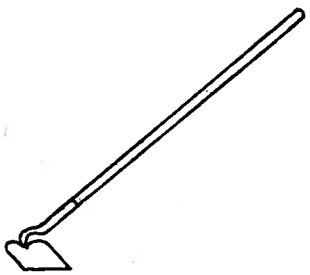


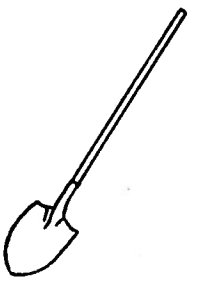



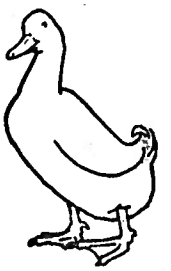


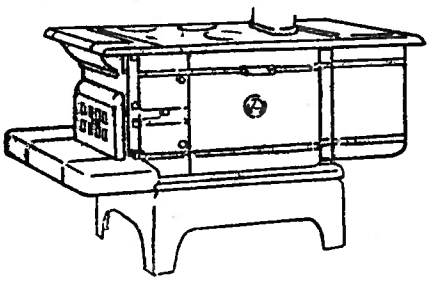


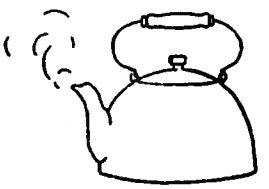






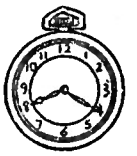


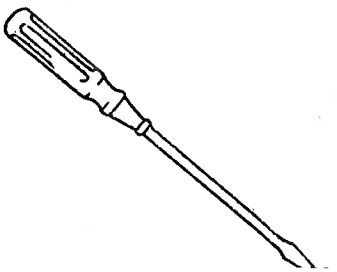


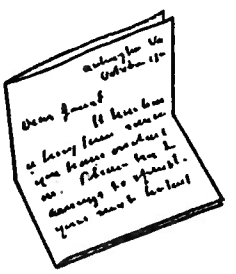


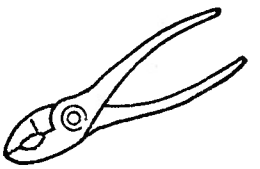


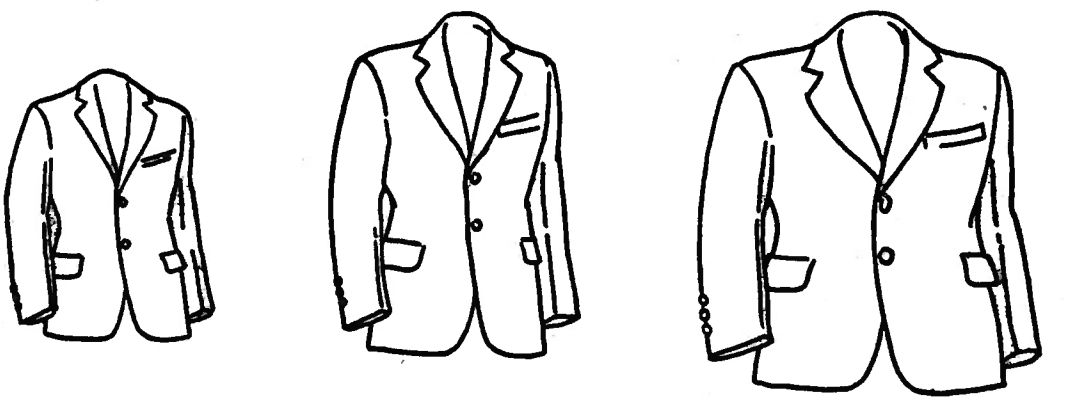


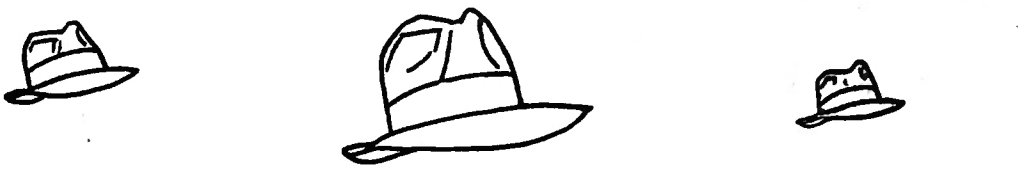


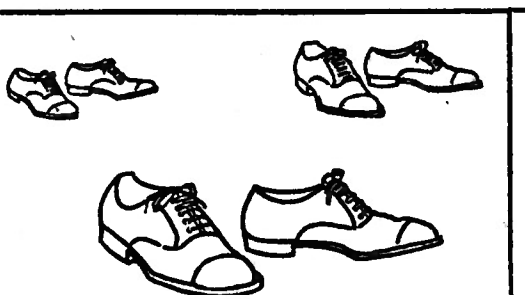


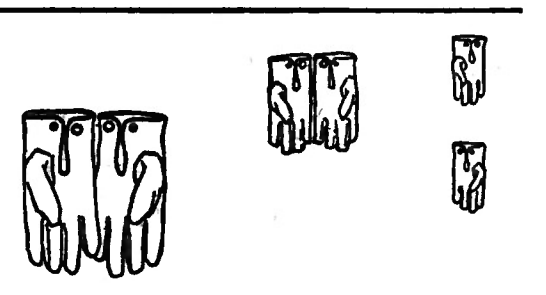


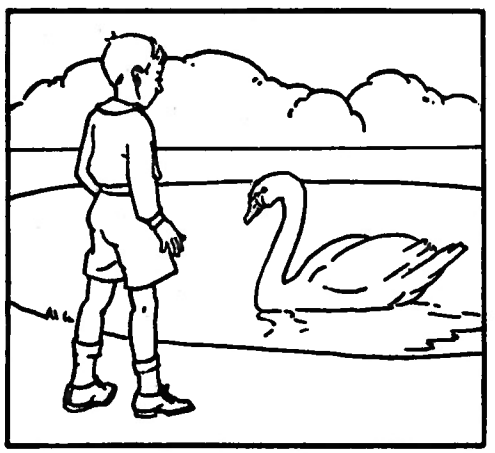


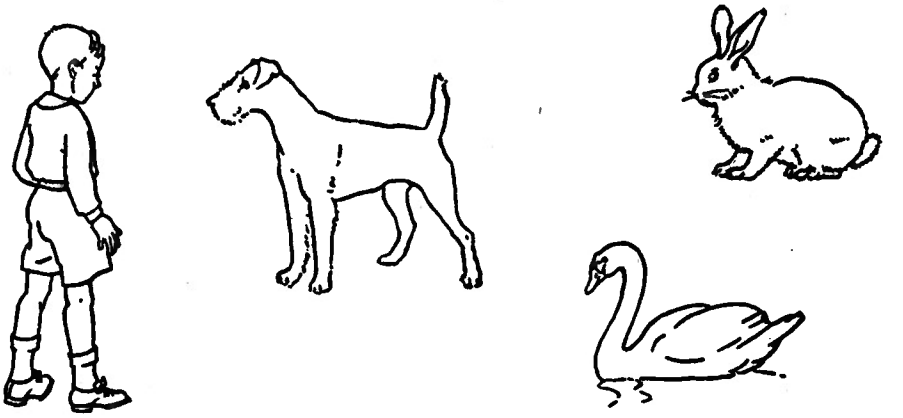


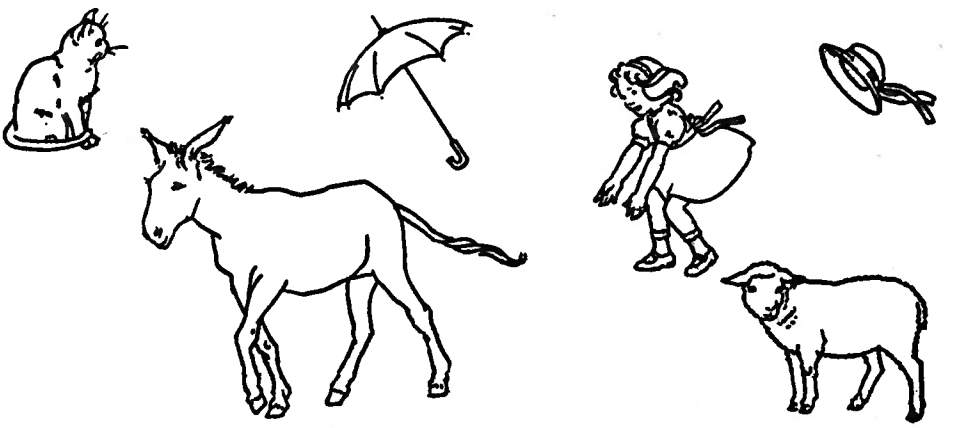


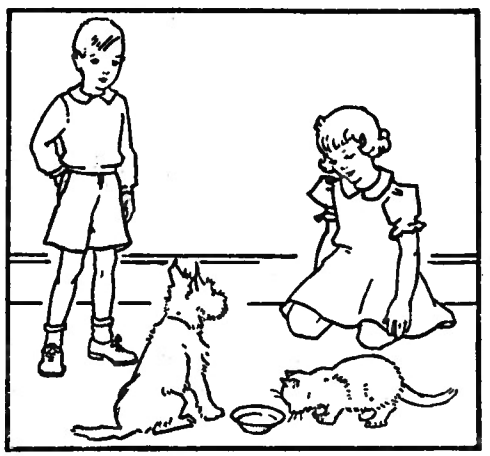


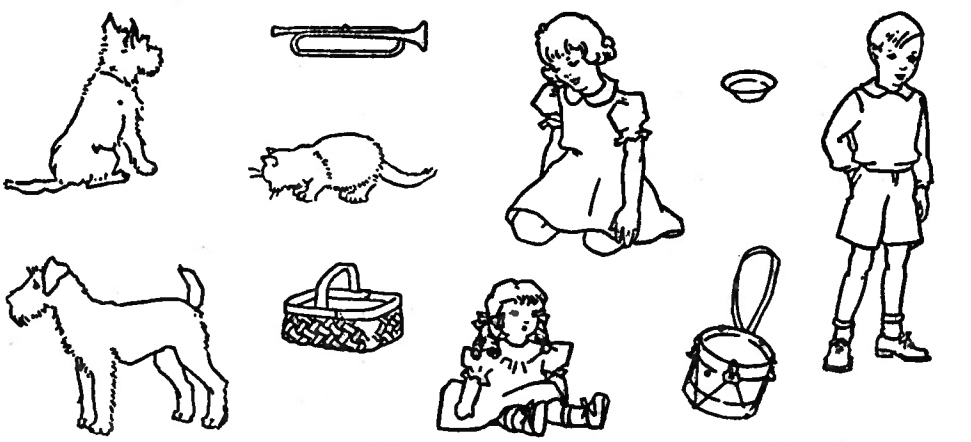


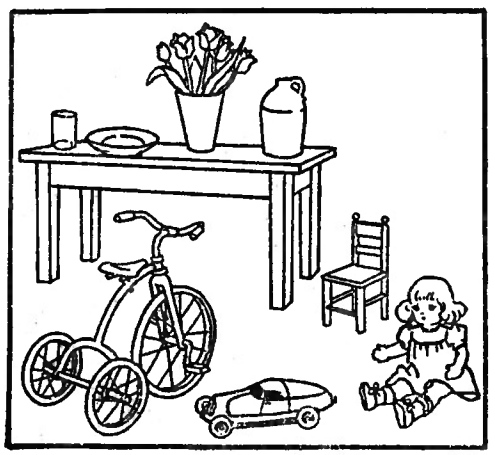


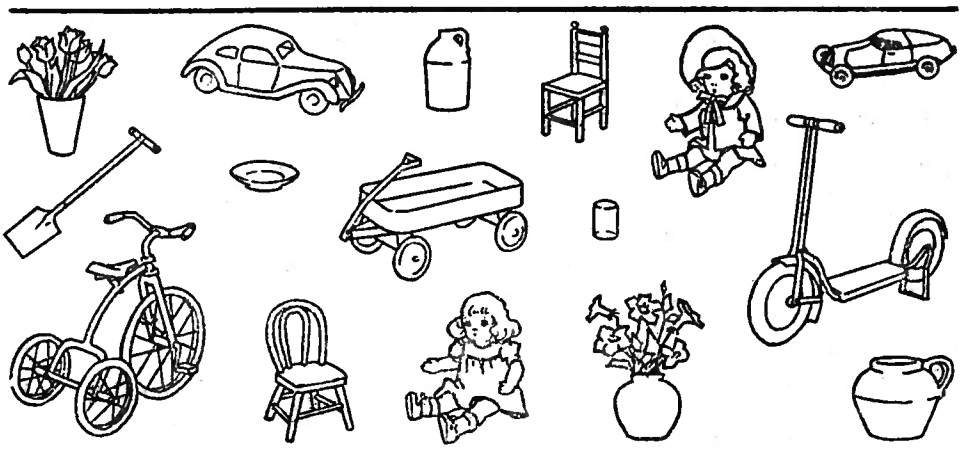


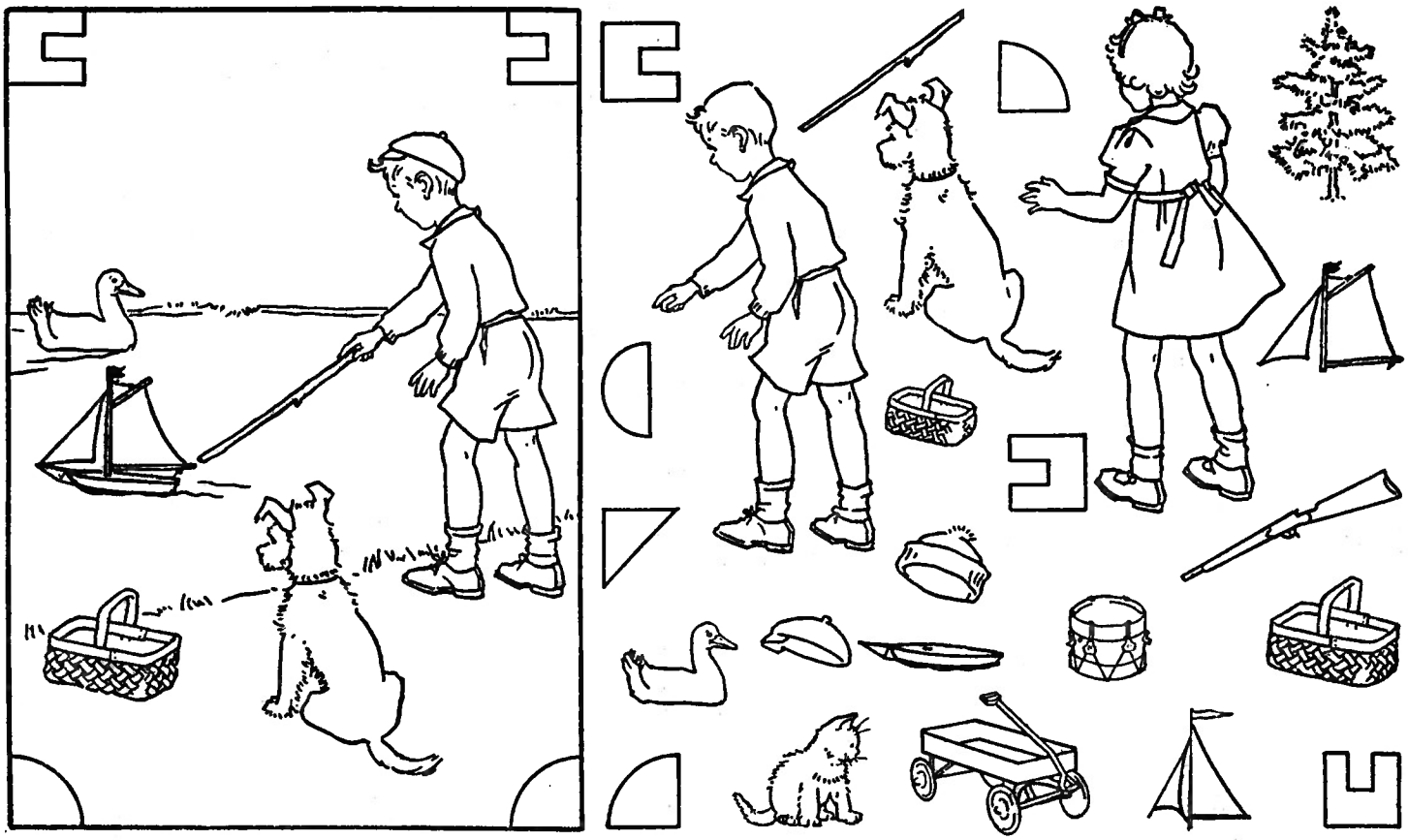




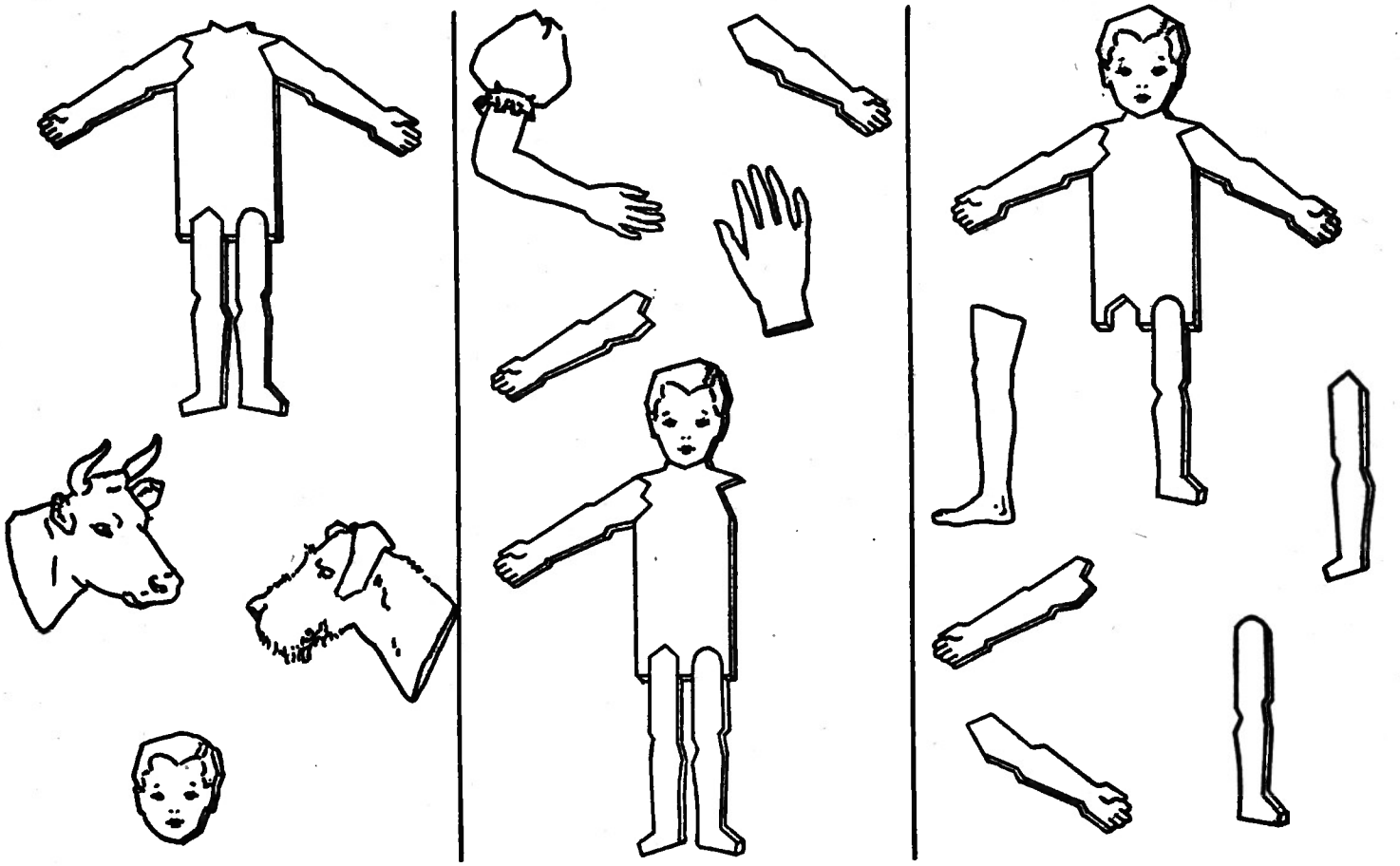


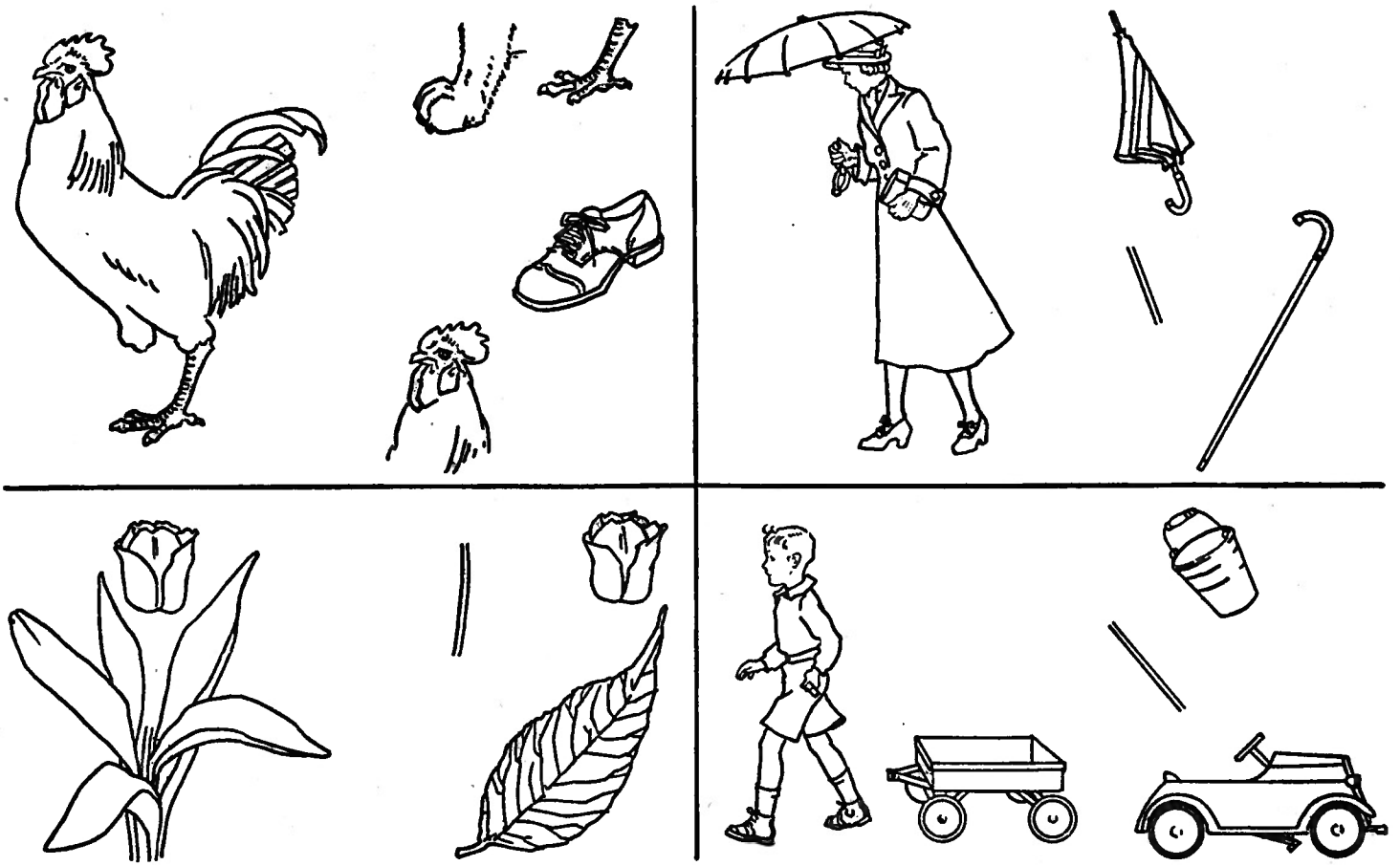


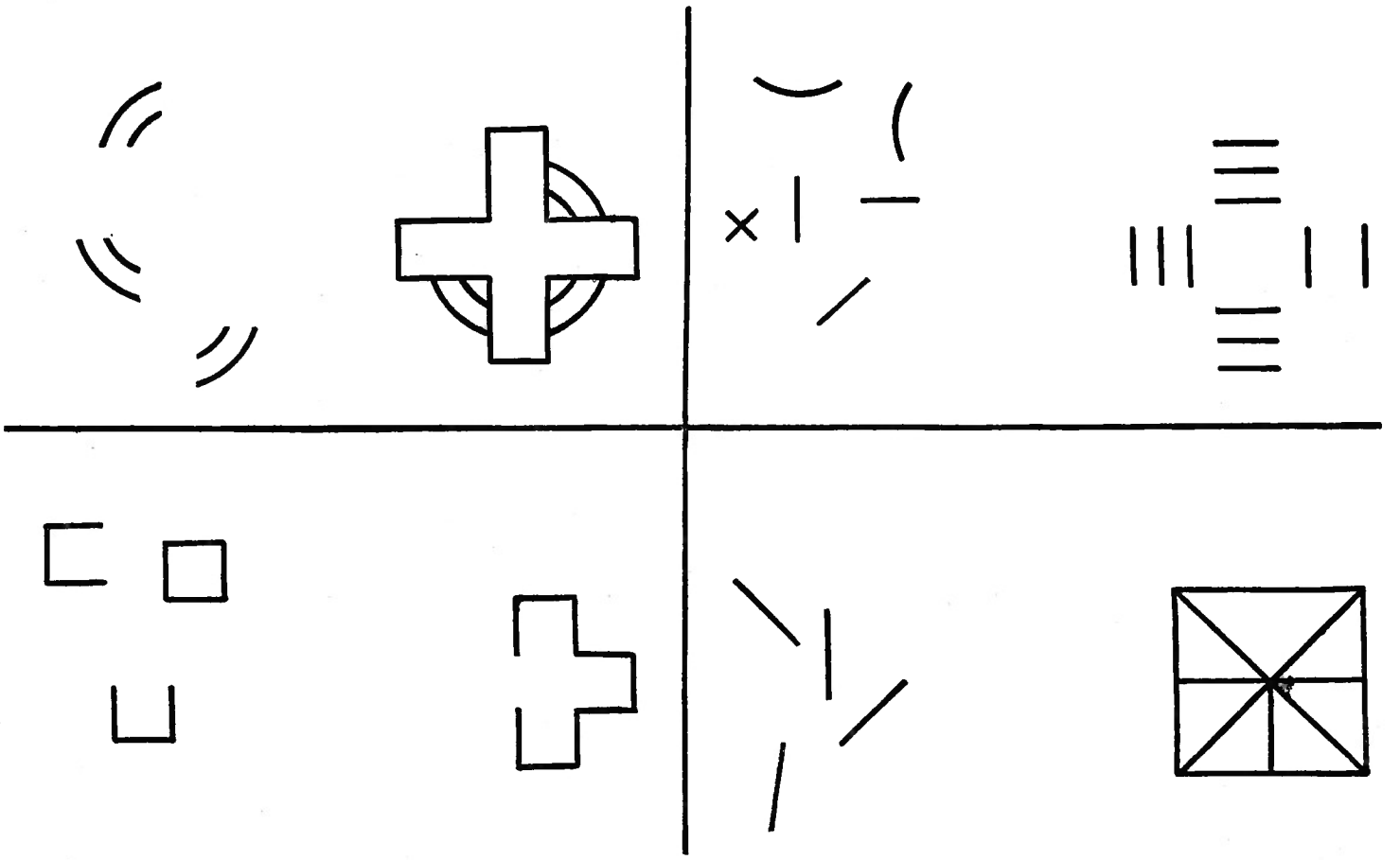




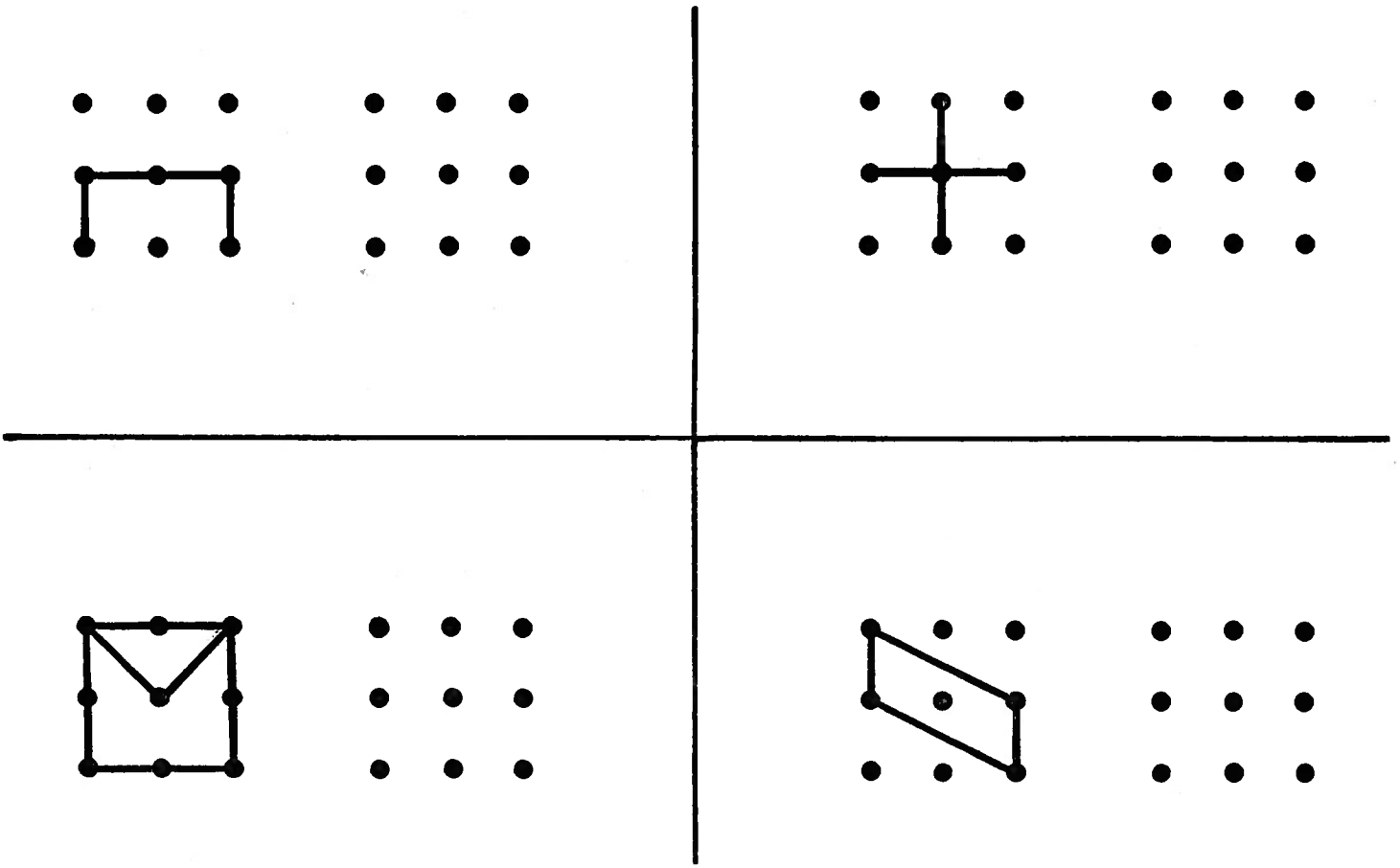
Total number right..... *Total number wrong*..... *Score* $\left(\frac{R-W}{3}\right)$.....

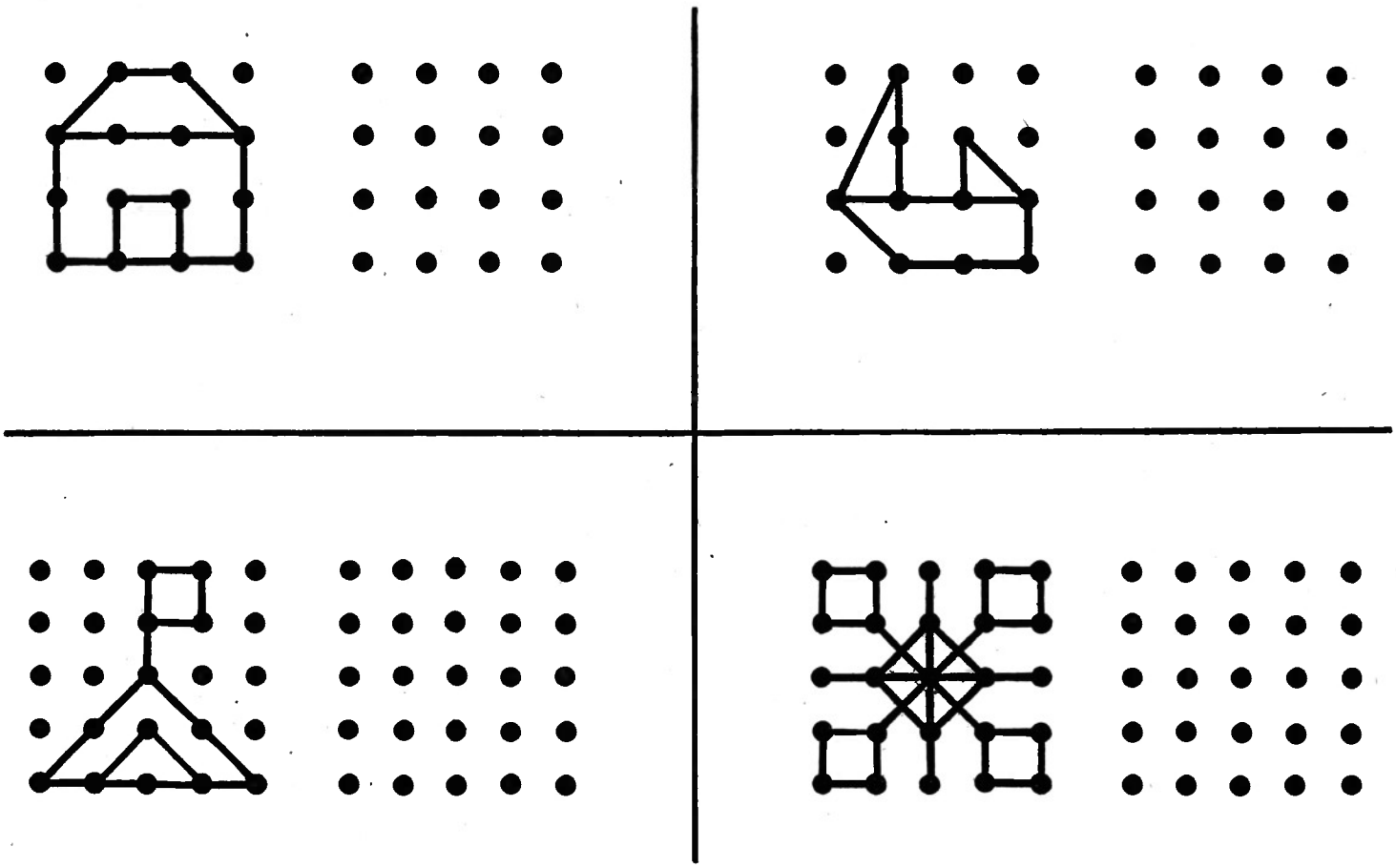






Score





Score